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The IRON AGE

JUNE 17, 1948

hio Rolls
APING METAL FOR ALL INDUSTRY

STAYING POWER

On the job, producing longer without redressing, Ohio Rolls meet current demands for greater production in shorter time. Ohio Rolls are known for strength, wear resistance, rigidity and surface perfection.

Select from any of these eleven types of Ohio Steel and Iron Rolls: Carbon Steel Rolls, Ohioloy Rolls, Ohioloy "K" Rolls, HOLL-O-CAST Rolls, Chilled Iron Rolls, Alloy Chilled Iron Rolls, Denso Iron Rolls, Nickel Grain Rolls, Special Iron Rolls, Nicoloy Rolls, Flintuff Rolls.

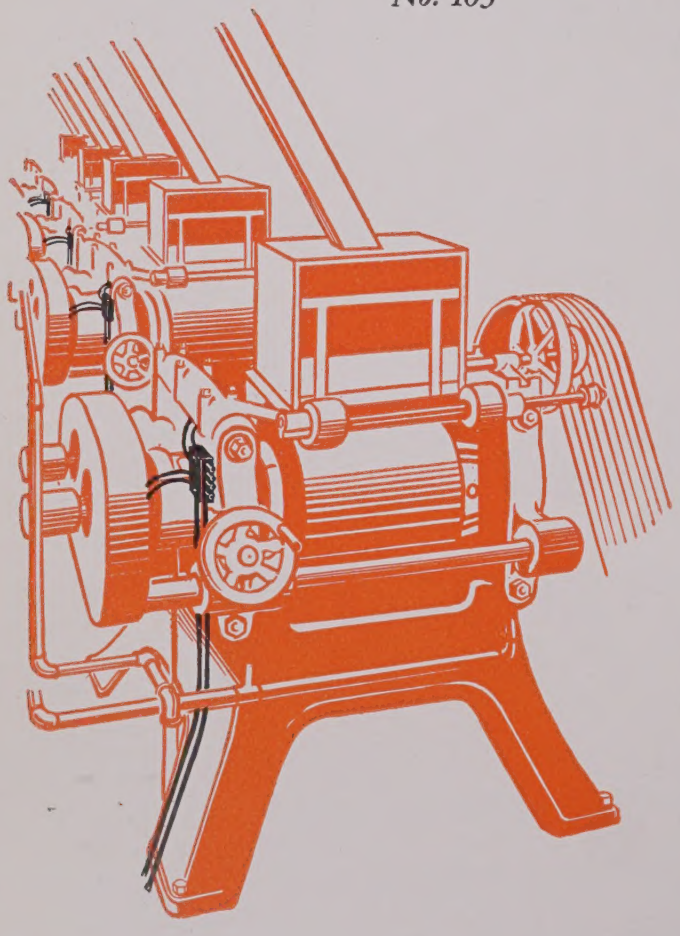
E OHIO STEEL FOUNDRY COMPANY—LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

In 15 months

Farval pays for itself in power savings alone

FARVAL—*Studies in Centralized Lubrication No. 103*



IN one of the plants where a well-known breakfast cereal is prepared, Farval was installed on a battery of ten flaking mills. By comparison with ten identical mills which were lubricated by hand it was possible to measure immediately the benefits of automatic centralized lubrication.

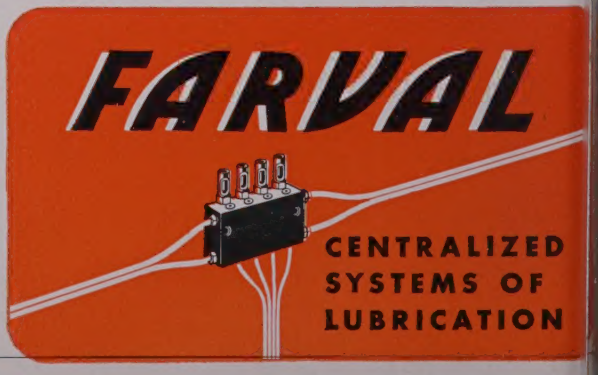
A group of ten mills is handled by one operator per 8-hour shift, and there are three shifts per day. It takes two hours per shift to keep 10 machines oiled by hand. Thus with Farval fully automatic lubrication six hours of oiling time are saved each day.

A careful record was kept of the 10 Farval-equipped mills and it was found that the savings in power alone would pay for the complete Farval installation in 15 months. Adequate lubrication with Farval has reduced bearing replacement to the vanishing point. Even more important, it has increased machine production by eliminating shutdowns for repairs. Now Farval systems are going in on additional flaking mills.

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. It does its work while the machine is in operation. Farval—the Dualine System with the Positive Piston Displacement Valve—that has but 2 Moving Parts—is Fully Adjustable—and with a Tell-tale indicator at each bearing to show the job is done.

Savings comparable to the above can be made on your equipment with Farval. Write for Bulletin 2. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



THE IRON AGE, published every Thursday by the CHILTON CO. (INC), Chestnut and 56th Sts., Philadelphia 39, Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $20 per year. Single Copies 35¢. Annual Review Number, $2.00. Vol. 161, No. 25.

Photo courtesy of
The Gabriel Company

Smoothing out the rough spots with dependable, easy • to • fabricate

ELECTRUNITE

TUBING

Typical of the many diversified applications for Republic ELECTRUNITE Tubing is this modern "Aerotype" shock absorber used on many leading passenger cars, trucks and buses. Tubular parts include an *inner working tube* which houses a piston and oil supply, an *intermediate tube* containing the oil reservoir, and an *outer dust tube* which protects the inner mechanism.

Just as this shock absorber smooths out the rough spots in the highway, so can ELECTRUNITE Tubing smooth out the rough spots in your own fabricating picture. As produced by Republic's improved process of electric resistance welding, ELECTRUNITE Tubing is uniform in diameter, wall thickness and roundness—*throughout every length and every shipment.* Uniformly high ductility makes this modern tubing easy to fabricate, and its smooth, clean surfaces take any plated or painted finish readily and economically.

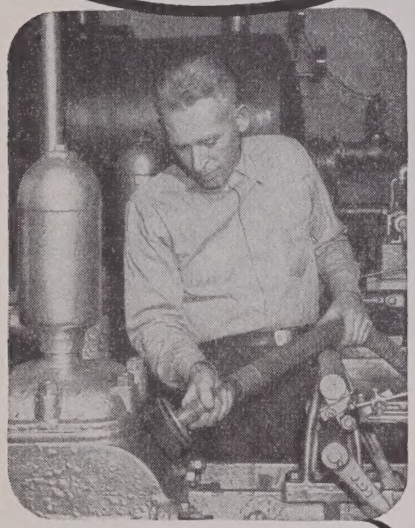
Complete information, including a list of available sizes, gauges and analyses—in both carbon and stainless steel—is available upon request. Write *today* to:

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO
Export Department: Chrysler Building, New York 17, New York

Republic
REPUBLIC STEEL
REG U S PAT OFF
ELECTRUNITE TUBING

Fast, Efficient, Thorough "Dry-Scouring" with

EXIDUST



● Coal-dust in the boiler room, dirt on machinery, filings around a lathe, lint on the walls—EXIDUST gets them all. This central vacuum system supplies cleaning suction so powerful it can pick up nuts and bolts . . . "heavy" dirt doesn't have a chance.

● EXIDUST's strong vacuum is piped to convenient spots throughout the plant or building—and flexible hose connections, with nozzles for every kind of cleaning job, give fast and effective cleaning to every surface. The ample, efficient separator in the basement removes all dust from the air—makes recovery easy of salvageable waste.

● EXIDUST cleaning is *effective—efficient—economical.* For free booklet, mail this coupon today.

ALLEN BILLMYRE DIVISION
Lamson Corporation
485 Lamson St., Syracuse 1, N. Y.

☐ Please send bulletin on EXIDUST Central Vacuum Cleaning System

☐ I would also like to know about EXIDUST Portable Vacuum Cleaners

Name.....

Address.....

City.....Zone....State.....

Fatigue Cracks

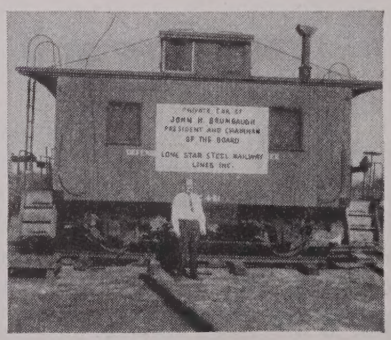
BY C. T. POST

Labor Harmony

• • In these days of frequent recriminations between employers and unions, the perfect harmony between the New York garment manufacturers and the International Ladies Garment Workers Union stands as a beacon of hope. Until the other day, we never could figure out why labor negotiations in this highly competitive field seemed to go so smoothly. Then we learned that the representative and executive director of the National Dress Manufacturers' Association bears an aptronym of accord. His name is I. Agree.

Private Car

• • No group exemplifies the opportunity to advance from menial to high places under the American free enterprise system like the railroad presidents. Locomotive wiper or office boy invariably seems to be the first rung on the



ladder whose top rung is a private Pullman. We're now glad to report that one of the beagles of your family journal's brains department has found the exception that proves the rule. D. I. Brown, whose news quest led him to Texas Lone Star Steel plant, submits the case of John H. Brumbaugh whose private car came first, railroad presidency later. Brumbaugh never wiped locomotives because his railroad never had any. In fact, its entire rolling stock, which doesn't roll, consists of his private car.

Brumbaugh's background, as far as the eye can see, is that of a top rate blast furnace man. After he had retired from Republic Steel, the lure of Texas got him and he signed on with Lone Star Steel to get its virgin stack, built during the war but never blown in, into iron production. The housing problem he encountered when he reported for duty was not one of a bulging industrial center, but of a modern pioneer settlement hewn from the East Texas pine woods, where there were few houses of any kind. He was shopping for tents when he spied a lonesome caboose, left from the days when the government built the plant. Brumbaugh and the caboose fell in love at first sight, and in no time at all he was bedded down. To make everything legal, the boys at the plant affixed a large sign: "Private Car of John H. Brumbaugh, President and Chairman of the Board, Lone Star Street Railway Lines, Inc."

The other day a high official of the Santa Fe, visiting Lone Star, was introduced to the blast furnace man. Brumbaugh's face was blank for a minute, when Santa Fe was mentioned. Then, with a glow of recognition for his fellow railroader, he allowed as how he'd heard of a jerkwater railroad called the Santa Fe.

Tough Rivets

• • Frederick C. Othman is a syndicated newspaper columnist who attempts to describe the Washington scene in a humorous vein and generally succeeds. Sometimes he doesn't realize just how funny he is. The other day Othman declared that the War Assets Administrator Jess Larson is stuck with "hundreds of case-hardened rivets for battleships," obsoleted by welded construction.

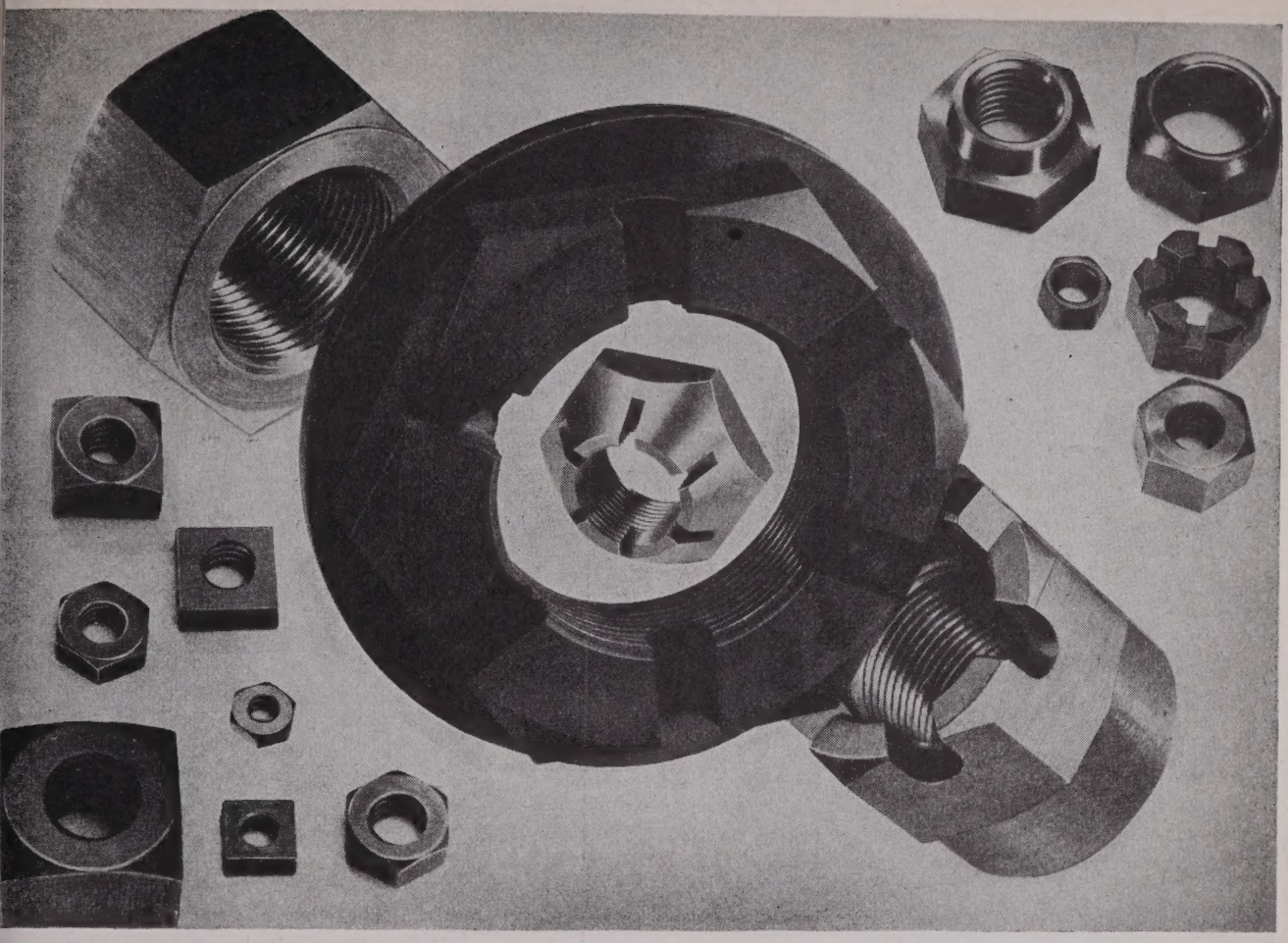
"You may ask why doesn't Mr. Larson melt down his rivets?" inquired Othman, then answered himself, "They've got so much alloy in 'em, to make 'em tough, that they won't melt in any ordinary blast furnace."

Some of you men with extraordinary blast furnaces better step right up. An astounding open hearth or an amazing electric furnace might even do the trick.

Dud

• • In the same column, Othman told of a "Pennsylvania junk man, who nearly had his head blown off when he stumbled while carrying a case of WAA bolts and nuts. Somebody had made a slight mistake in the label, was all. It should have said: dynamite."

Personally, we'd just as soon drop a case of dynamite as bolts and nuts—just so we were wearing safety shoes. The only explosive thing about either bolts or dynamite, on a drop like that, is the language of the guy that drops 'em.



IT'S "t.f.e."

TO SPECIFY A BRAND OF *KNOWN* DEPENDABILITY

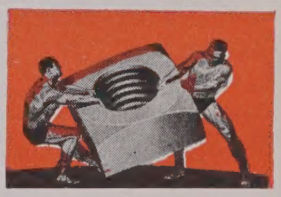
The only thing you can gain by buying nuts on "price" alone is an *illusion* of saving. When you buy on the basis of *total* fastening cost, your *actual* savings far exceed the amount of an imagined one.

RB&W builds into nuts (and other fasteners) the "know-how" from 103 years of fastener experience, developments of an outstanding research staff, and the benefits of the most modern machinery. This means substantial savings to you in time, money and dependability.

In addition, RB&W's quality control over production assures that *each* nut (bolt, screw, rivet or special) is fully capable of playing its part in *True Fastener Economy*.

TIME—Holes repunched clean and true—tapped in latest-design tappers—insure accurate and uniform thread formation for quick run-on.

MONEY—Cold-working of the metal also increases its density for greater load-carrying—maximum holding per dollar of initial cost.



DEPENDABILITY—The RB&W cold-punching process in itself insures a sound product, free from structural defect.

t.f.e.

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THE COMPLETE QUALITY LINE

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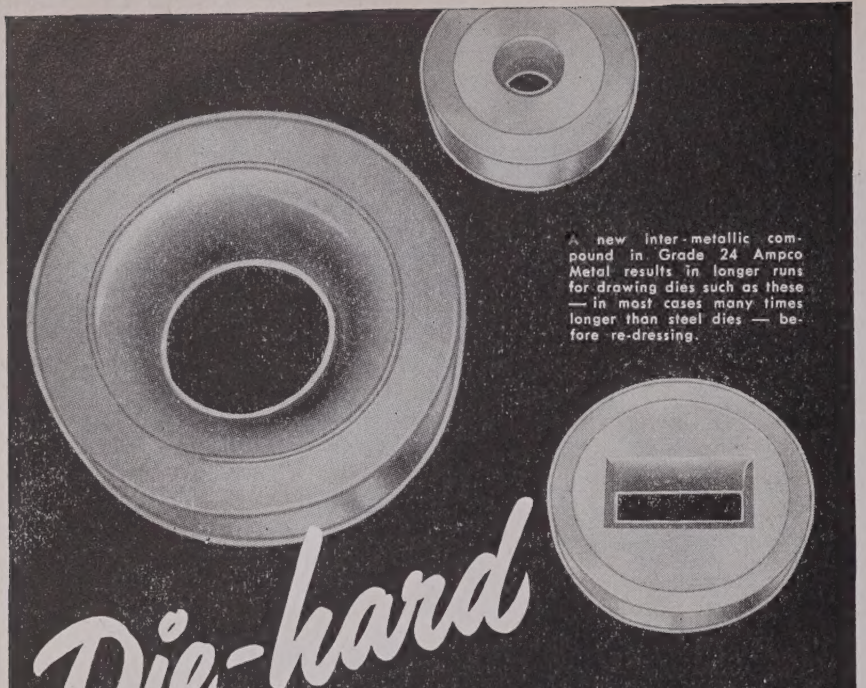
103 Years Making Strong the Things That Make America Strong


A new inter-metallic compound in Grade 24 Ampco Metal results in longer runs for drawing dies such as these — in most cases many times longer than steel dies — before re-dressing.

Die-hard

Ampco Metal Grade 24 cuts your drawing costs

Gives longer runs before re-dressing — no galling and loading on stainless steel

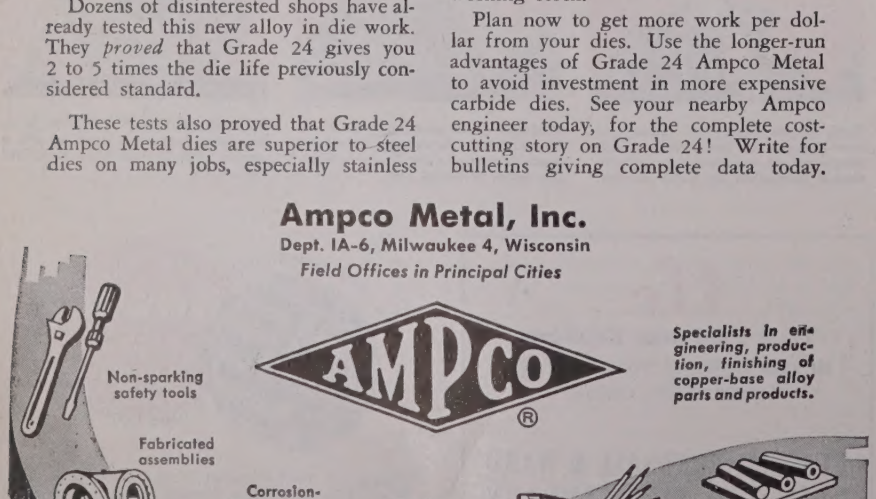
Here's the new Ampco Metal Alloy — Grade 24. It gives you more hardness and compressive strength than any other bronze — even more than Grade 22 Ampco Metal which you have used for your drawing and forming work in the past. Machinability of Grade 24 is about the same as that of Grade 22.

Dozens of disinterested shops have already tested this new alloy in die work. They *proved* that Grade 24 gives you 2 to 5 times the die life previously considered standard.

These tests also proved that Grade 24 Ampco Metal dies are superior to steel dies on many jobs, especially stainless steel. A typical test case showed a 77,000 run on an Ampco Metal die, compared to a 3000 run on a steel die. The Ampco Metal die does not seize or gall. There is less frequent need for re-dressing. As a result, you get longer runs at lower cost. Actual superiority varies according to die-tolerances and working stock.

Plan now to get more work per dollar from your dies. Use the longer-run advantages of Grade 24 Ampco Metal to avoid investment in more expensive carbide dies. See your nearby Ampco engineer today, for the complete cost-cutting story on Grade 24! Write for bulletins giving complete data today.

Ampco Metal, Inc.
Dept. IA-6, Milwaukee 4, Wisconsin
Field Offices in Principal Cities



Dear Editor:

STEEL PRICE SPREADS

Sir:

In our wholesale price index, use the prices of certain me products published in THE IRON A We note that the May 6 issue show price reductions generally in li with those made by U. S. Steel Co The May 13 issue, however, show range of prices at Pittsburgh on t following products: Concrete rei forcing bars, hot-rolled bars, co finished bars, carbon steel plat hot and cold rolled sheets, skelp a wire rods. We should appreciate if you will kindly advise us what t prices in the upper and lower e of the range represent. The pri for some products, such as skelp, the "Comparison of Prices" page not agree with either end of t range. Will you please advise how the composite price of 2.8 per lb for skelp in the May 13 iss is obtained.

We understand that U. S. Ste new base price on cold-rolled strip 3.45¢ per lb in Pittsburgh. You qu a price of 3.535¢ per lb in the M 13 issue. Will you please advise to the reason for the difference.

The price of wire rods v changed from 2.80¢ per lb to 3.0 in the May 13 issue. When did t price of 3.025¢ first become effect and what does it represent? note that certain other trade pub cations are still quoting wire r at 2.80¢ per lb Pittsburgh.

EWAN CLAGU
Commissioner of Labor Statis
U. S. Dept. of Labor
Washington

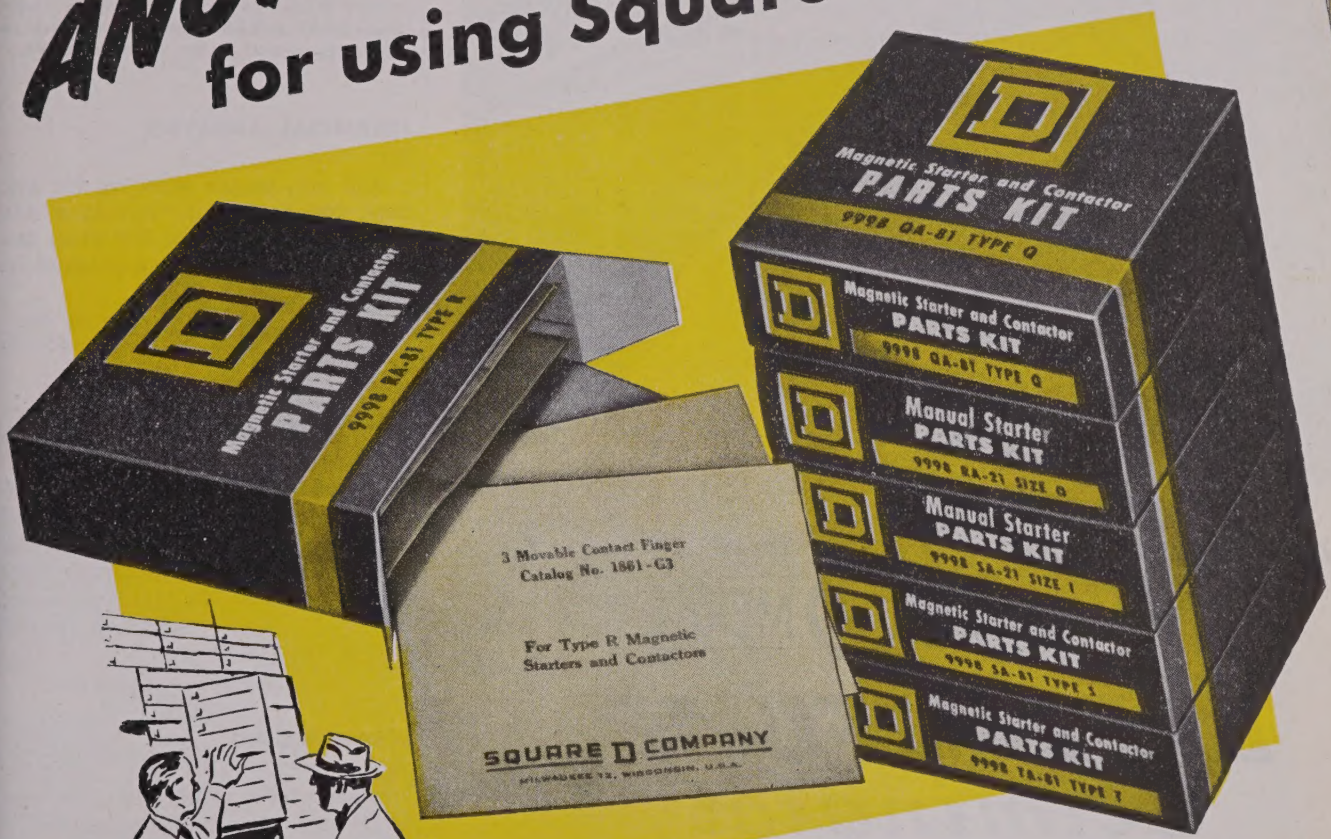
• The quotations published on the C parison of Prices page, including the v ous composite prices, represent the averc of the prices quoted by producers at m basing points — Pittsburgh, Chicago, G Cleveland and Youngstown. Price ran are published on the Iron and Steel P page indicating the highest and lowest pr charged by all producers at each ba point. U. S. Steel Corp.'s price on c rolled strip is based at Cleveland, not P burgh. In the May 13 issue, an increas wire rod prices was shown and we rev retroactively to the issue of Apr. 13.—Ed.

BRASS PRICE BAROMETER

Sir:

We are endeavoring to develo barometer for use in following a possibly forecasting changes in prices we will pay for articles fa ricated from brass, and have that the best index could be dev oped from a comparison of the c of brass and the labor cost per u

ANOTHER Good Reason for using Square D Control



New "OFF-THE-SHELF" Parts Kits make normal maintenance easier than ever!

All motor starters and contactors are subject to periodic contact replacement under conditions of heavy load or frequent operation. That's why Square D has always stressed accessibility of these parts. Now, the parts themselves are packaged in easy-to-stock kits to make that replacement job even more simple.

Each kit contains all parts necessary to replace load contacts on two or three-pole contactors and starters. Parts are individually packaged in clearly labeled envelopes. An illustrated service bulletin is enclosed to provide quick parts identification and complete installation instructions.

Six different Class 9998 Parts Kits are available for servicing Sizes 0 and I manual starters and Sizes 00, 0, I and II magnetic starters and contactors.

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SCRUB... *the* AIR *in your plant* CLEAN

with Schmieg CENTRI MERGE *Automatic* DUST and FUME Eliminator

Dust and fumes don't get a chance to circulate in plants equipped with a Schmieg CENTRI-MERGE Eliminator. The moment dust or fumes develop from buffing, burring, grinding, polishing, curing or any other processing operation, they are swept up on an air stream that carries them back through ducts to a central Collection Unit. In the washing chamber of this Unit the CENTRI-MERGE high pressure centrifugal water action literally *scrubs* every last vestige of contamination from the air stream—cleans it so thoroughly that, in many cases, it can be recirculated back into the plant. That's why users are so enthusiastic about what CENTRI-MERGE accomplishes. Protects both workmen and work.

Consult Schmieg engineers regarding your problems of dust and fume control.

THE *best* AIR PURGE *is* CENTRI MERGE

Schmieg INDUSTRIES INC.
Engineers & Manufacturers

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of production. Will you kindly advise us if you have an index which shows brass prices.

C. M. WIEGAND
Assistant Manager
Avon Allied Products, Inc.
Suffern, N. Y.

• **Our nonferrous price page gives weekly quotations on brass mill products from which you will be able to construct your index. Prices for brass and copper scrap, which might well be integrated into such an index, are quoted on the same page.—Ed.**

FINANCIAL ANALYSIS

Sir:

Will you please send us, for our files, two copies of "THE IRON AGE Financial Analysis of the Steel Industry, 1947-1946" as published in the April 8 issue.

OLD COLONY TRUST CO.
Investment Analysis Section
Boston

HEAT RESISTANT ALLOYS

Sir:

We would appreciate having a reprint or tearsheets, two copies, of the following article: "Summary of Heat Resistant Alloys from 1200° to 1800° F" from the March 18 issue.

RALPH H. HOPP
Battelle Memorial Institute
Columbus, Ohio

STRAIN AGING

Sir:

In your issue of May 13 there was an article "Strain Aging Criteria." We would appreciate very much having a half dozen reprints of this for our distribution here.

W. H. BRETT
Vice President
Alliance Ware, Inc.
Alliance, Ohio

BABBITTING METHODS

Sir:

We noticed a reference made in Product Engineering to an article in THE IRON AGE on the development of new alloys and new babbitting techniques. Will you be kind enough to send us the issue in which the article appeared.

H. G. SEMLER
Superintendent
McQuay-Norris Mfg. Co.
Indianapolis

• **Tearsheets of the article "New Developments in Babbitting Methods" from the Dec 25, 1947 issue have been mailed.—Ed.**

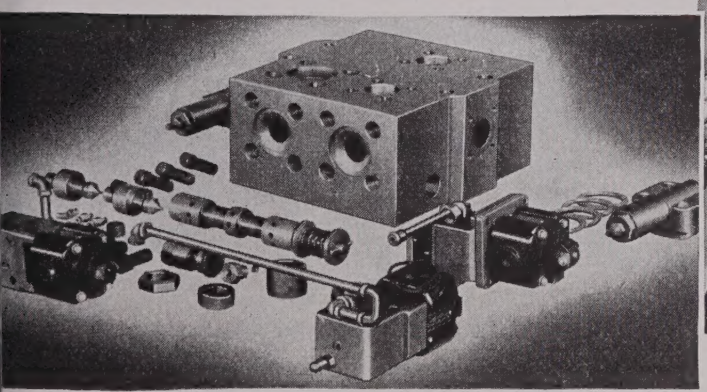
INVESTMENT CASTING

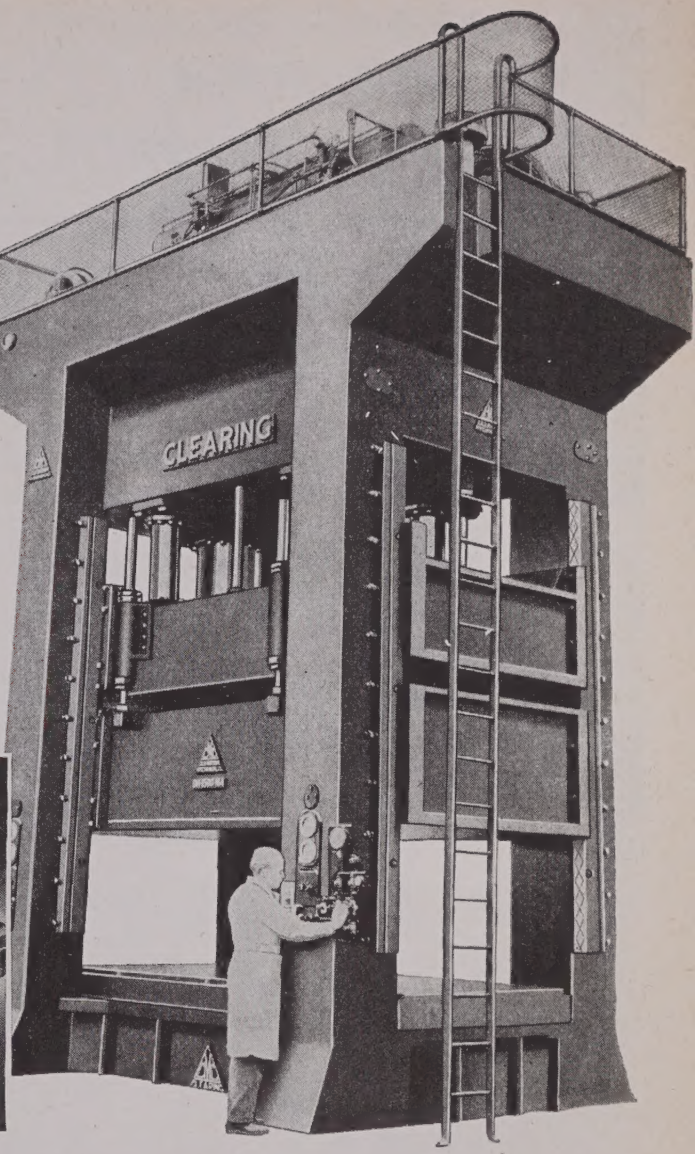
Sir:

We would appreciate having a reprint of your excellent technical paper "A Critical Survey of Investment Casting." This two part arti-

CLEARING
MECHANICAL & HYDRAULIC

INSET: Main operating valves of Clearing hydraulic systems are combined in a single forged steel block with ports and passages drilled from solid. Swift, automatic and safe performance of all hydraulic press functions is assured by this unique Clearing development.





HOW DO YOU MEASURE ECONOMY?

Substitution of press methods for casting, machining, or other slow means of manufacture will almost invariably result in a substantial saving in production costs. But whether such a step gives you maximum economy depends upon how efficiently you are able to operate your presses.

Don't be content with "a saving." Get *all* the saving you can, while you're at it. Consider die life, press output, operating and maintenance costs. Don't forget that delays and extra work in assembly should be charged to press costs if they are due to inaccurate or varying stampings.

Proper consideration of all pertinent factors will lead you most often to Clearing presses. That's a statement that's hard to explain but easy to prove. We'll be glad to prove it to your satisfaction—and to your profit as well. Put your problem up to our engineers.

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CLEARING THE WAY TO EFFICIENT MASS PRODUCTION

FORT PITT BRIDGE

Provides Modern Ideas in

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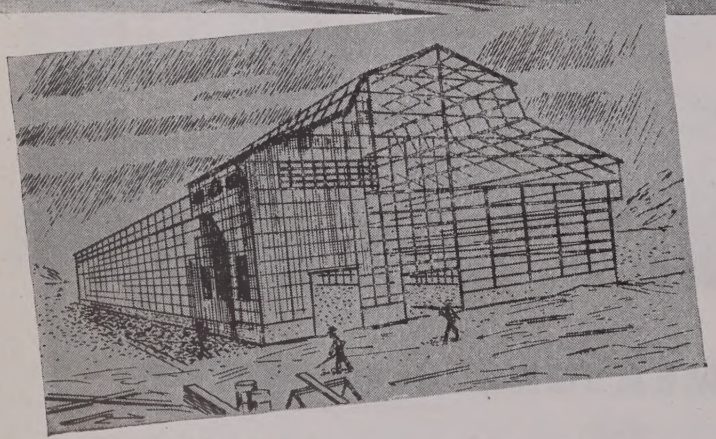

Whether your plans call for an addition to your present facilities, or a completely new structure—take advantage of the skill, experience and practical help Fort Pitt Bridge can provide. Let our engineers help you in the early planning stage.

"STEEL PERMITS STREAMLINING CONSTRUCTION WITH SAFETY, ENDURANCE AND ECONOMY"

WHEN PLANNING TO USE FABRICATED STEEL—THINK FIRST OF

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cle appeared in your May 6 and 13 issues.

GEORGE HALL
NEPA Project, Fairchild Engine & Airpline Corp.
Oak Ridge, Tenn.

AUTOMOTIVE BOLTS

Sir:

We would greatly appreciate receiving a reprint of "Automotive Bolts" as published in your Aug. 23 and 30, 1945 issues.

W. A. FITZGERALD
Purchasing Agent
St. Louis Car Co.
St. Louis

• **Tearsheets have been sent.—Ed.**

ALUMINUM SHEET CONTROL

Sir:

We would appreciate it very much if you would forward to us 6 copies of the article "Aluminum Sheet Control" from the May 13 issue.

R. A. BEAS
Builders Structural Steel Co., Inc.
Cleveland

MANAGEMENT METHODS

Sir:

We are interested in receiving the book "Practical Management" and would appreciate your sending us a copy and billing us for same.

A. H. RENTNER
Vice President
Line Material Co., Zanesville Div.
Zanesville, Ohio

• **Copies are available at $3.00 each.—Ed.**

TIME STUDIES

Sir:

We shall be grateful if you will send 6 reprints of the article "Right and Wrong of Time Study Computations" from the Aug. 17, 1944 issue.

R. McBRIDE
Research & Engineering Dept., UAW-CIO
Detroit

• **Tearsheets have been sent.—Ed.**

RADIOACTIVE TRACERS

Sir:

I would appreciate receiving three copies of "Radioactive Tracers in Steelmaking" as it appeared in your April 29 issue.

C. E. DRURY
C. Tennant Sons & Co. of N. Y.
New York

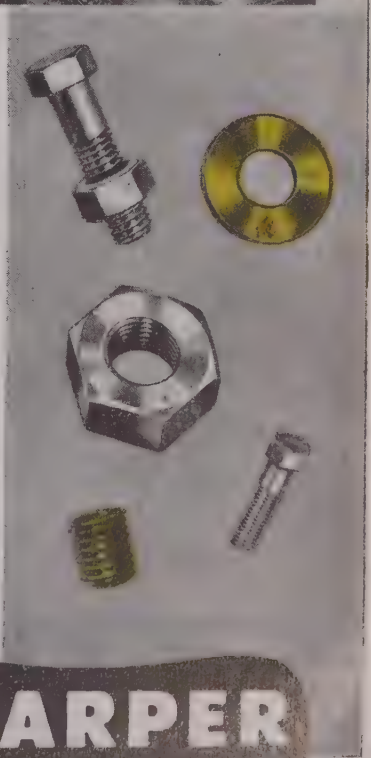
NONFERROUS ARTICLES

Sir:

We would appreciate your sending us tearsheets of each of the following articles: "Continuou

non-ferrous and stainless

fastenings



AVAILABLE TODAY FROM NEW YORK AND CHICAGO STOCKS

Whatever your requirements in non-ferrous or stainless fastenings you can undoubtedly secure them directly from Harper's enormous New York and Chicago stocks.

Harper has complete stocks of over 5,000 different types of bolts, nuts, screws, washers, rivets and nails in various non-ferrous metals and stainless steel. The variety of specifications is wide. Every item in ordinary use—and a great many so-called "specials"—are now in Harper warehouses. New items are being added constantly. The H. M. Harper Company ranks first in its field in size, variety and completeness of stocks.

Phone or wire Harper at New York or Chicago today and secure immediate shipment. If it should happen that your requirement really is "special," Harper has the technical experience, the trained engineers and the modern high speed equipment to manufacture according to specifications.

WRITE TODAY FOR CATALOG. It gives complete specifications on the widest assortment of types and sizes of Everlasting Fastenings available anywhere today.

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Harper Specializes in Everlasting Fastenings *
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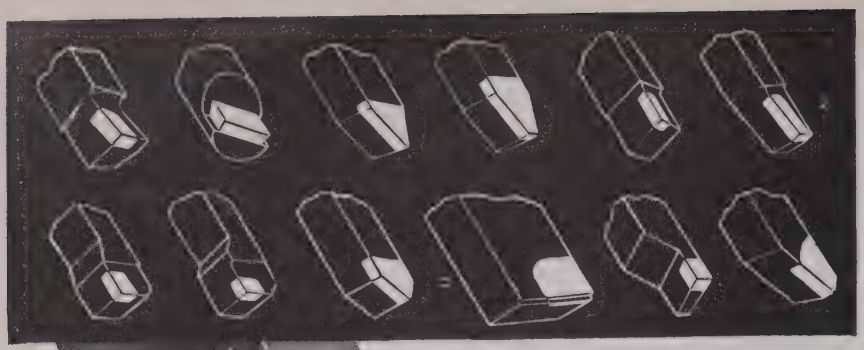
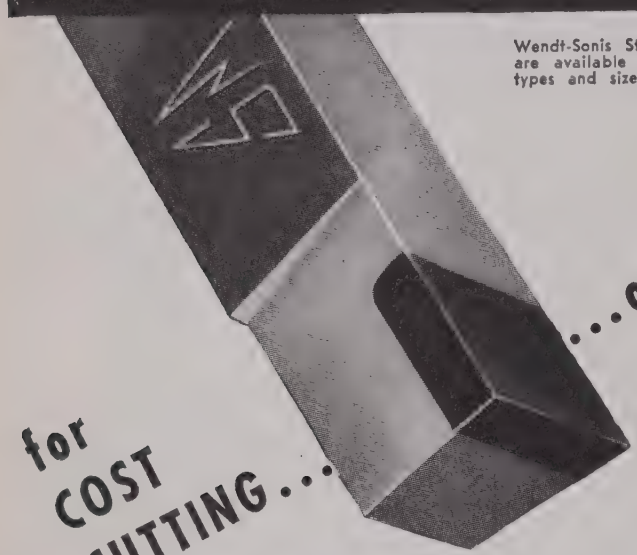
Reg. U.S. Patent Office*



Wendt-Sonis Standard Carbide Tools are available in a wide variety of types and sizes.



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- *Wendt-Sonis standard tool bits can be supplied with any grade of carbide required.*
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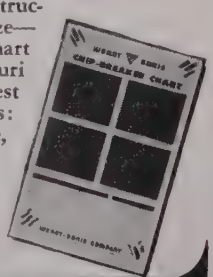

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Annealing of Nonferrous Strip," Jan. 8; "ABC's of Silver Alloy Brazing," Jan. 8; and "Some Notes of Tensile Testing," Jan. 22.

V. B. SEIDEL
International Nickel Co., Inc.
New York

STEEL CONSUMERS' SQUAWKS

Sir:

Not too long ago you published a resume showing customers' opinions of the job that various steel mills are doing in different districts of the U. S. If possible, we would like to have you send us a half dozen copies of this article.

EDW. STERN
Asst. General Manager

Allied Metals Co.
Niles, Ohio

• **"The Steel Consumer" from the Jan. 1 issue is the article you mean. Tearsheets have been mailed.—Ed.**

TEXAS STEELERS

Sir:

If available, I will appreciate your forwarding six reprints of each of the articles 'Texas Steel Consumers' Needs" in the April 29 issue and 'Texas Iron and Steel Producers" in the May 6 issue.

GEO. P. McCRACKEN
Sheffield Steel Corp.
Houston

METAL FINISHING

Sir:

Will you please let me know if I may obtain a copy of your book, "Metal Finishing Manual."

CLAYTON G. AMBROSE
Oakite Products, Inc.
New York

• **Copies of the manual are $3.00 each.—Ed.**

NONFERROUS ALLOY SPECS

Sir:

If you have available for sale a handbook on "Nonferrous Alloy Specifications" which you published some time ago we would like to purchase a copy for our engineering department. This is a handy book and gives all the essential information readily.

W. C. STAEFFLER
President

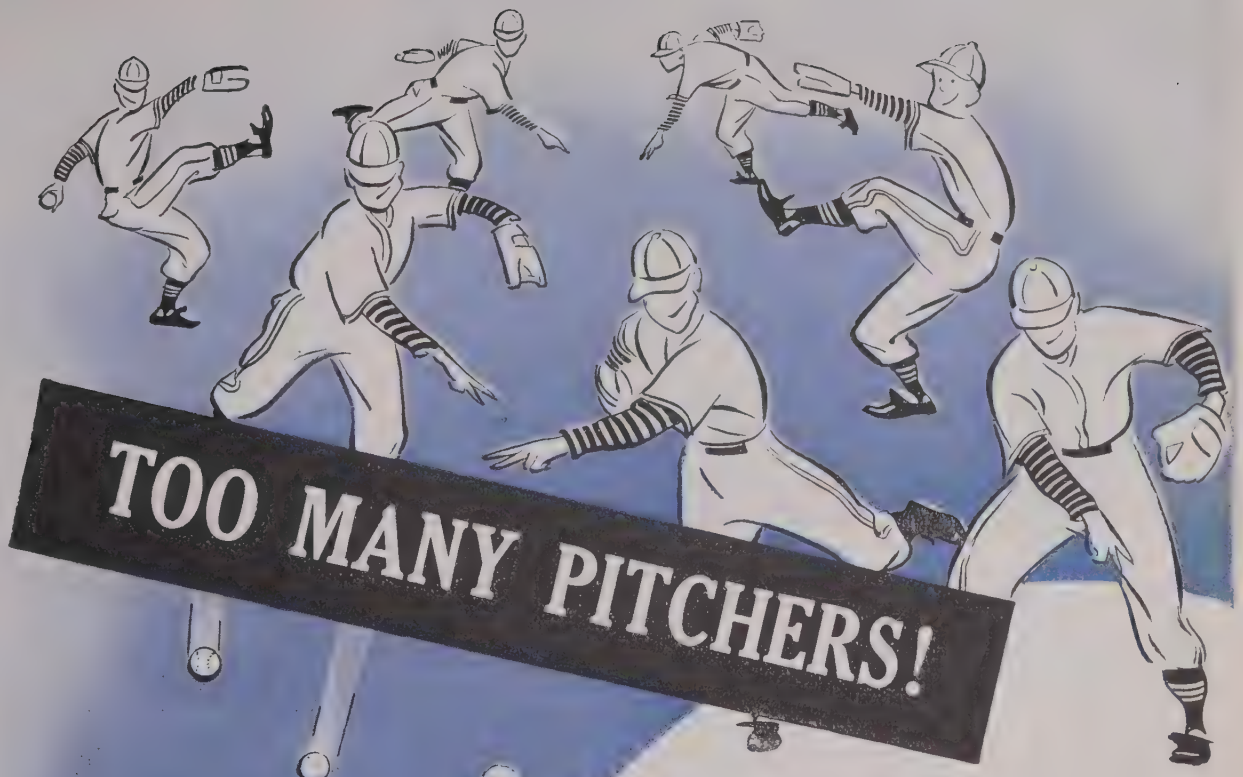
Eastman Mfg. Co. of Delaware
Wilmington, Del.

• **The handbook is available at 25¢ each or at 16¢ each for 5 or more copies.—Ed.**

COMPOSITE STEEL PRICE

Sir:

I am prompted to write you about your composite figure on finished



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FOLKS, they're just coming in too fast—and we *do* mean *orders!* In anything like normal times, we'd be awfully happy to have you pitch your order down our alley. Our past averages speak for themselves.

But *now*—well, honestly fellows—there are too many pitchers on that mound. We're in there swinging as hard as we can but we can only manage to get hold of a few. And there just aren't any pinch-hitters on the bench to help us out.

From your seat, our batting average no doubt looks weak at the present time. But we're doing the best we can and we're hitting 'em safe when we can get hold of 'em.

We're asking you to stick around for later innings when things settle down. That's when Wisconsin will really come through with those pay-off blows. Remember, the season isn't over yet. We hope we have a pennant winner for you.

WISCONSIN STEEL COMPANY

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WISCONSIN STEEL

Only new *PROTECTO-WELD* design gives you *all three magnet features*

Investment in a welded lifting magnet, to be sound, ought to satisfy three vital requirements. They apply equally to all types of operation, whether steel mill, scrap yard, railroad or fabricating plant.

Is the magnet rugged enough for the roughest jobs? Ohio Protecto-Weld Magnets withstand hard knocks day in and out for years. Heavy-duty outer ring and top plate are welded together ON TOP OF THE MAGNET. Frequent blows against magnet side cannot crack or damage welded area. Magnet remains hermetically sealed against moisture indefinitely!

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Only Ohio Protecto-Weld Magnets give you *all three big advantages.* Sizes include 39, 55 and 65 inches diameter; 4, 6 or 8-coil construction. Write today for details to Ohio—*leader in magnetic materials handling.*

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THE OHIO ELECTRIC MFG. CO.

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steel. Will you kindly advise me what your composite figure for steel was a year ago and at the present time. What steel products does it include?

STARR H. BARNUM
President

Bigelow Co.
New Haven, Conn.

• **The composite price for finished steel is an index of base prices of selected steel products weighted quarterly by the shipment figures reported by the industry. It is based on prices for steel bars, shapes, plates, wire rails, black pipe, hot and cold rolled sheets and strip. It does not reflect any extra charges. A tearsheet from the current issue has been sent you showing the finished steel composite price this week, a week ago, a month ago and a year ago.—Ed.**

TRADE NAMES

Sir:

We would appreciate receiving three copies of your "Directory of 10,000 Trade Names."

WALTER JONES

United States Steel Export Co.
New York

• **Copies of the Directory are $3.00 each for one or two copies; $2.50 each for 3 to 9 copies; and $2.00 each for 10 or more copies.—Ed.**

OXYGEN IN THE CUPOLA

Sir:

We would be very interested in receiving two tearsheets of the article "Oxygen Enrichment of the Cupola Blast" and one of the article "Gases in Cast Metals" from the April 22 issue.

E. SPIRE
Research Dept.

L'Air Liquide Society
Montreal

ENGINE BLOCK LINE

Sir:

Will you kindly forward tearsheets of the article "Packard Transfer Line Machines 50 Blocks an Hour" which appeared in the May 20 issue.

K. A. HILL
Asst. Professor of Management and Industrial Relations

Amos Tuck School of Business Administration, Dartmouth College
Hanover, N. H.

INVESTMENT CASTING

Sir:

Please send us 12 copies of your booklet "Precision Investment Casting—Lost Wax Process." Remittance is enclosed.

R. McNAIR
Director

McNair-Ryan School of Precision Casting
Los Angeles

• **Copies are available at $1.00 each.—Ed.**

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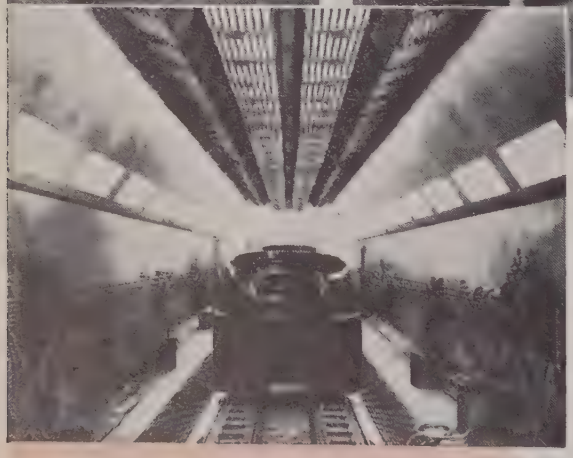
COMPLETE *Finishing* SYSTEMS

For ENAMEL • LACQUER • PAINT



The illustrations above show the interior of the Final Coat Hydro-Filter Spray Booth and a general view of the Final Coat Spray Booth and Drying Oven, which were installed in an open craneway. The Complete Mahon Installation at the Ford Truck and Bus Plant includes Metal Cleaning and Rust Proofing Equipment, Dry-off Ovens, Prime Coat Spray Booth and Drying Oven, Final Coat Spray Booths and Drying Oven for Small Parts, Final Coat Spray Booth and Drying Oven for Truck Cabs and Panel Bodies, Filtered Air Supply System for All Spray Booths, and a common Sludge Tank where the overspray from the several Spray Booths is deposited for reclamation or disposal.

Ford Truck Installation

Here is another typical example of Mahon planning and engineering. This Complete Finishing System was installed by Mahon in the Ford Truck and Bus Plant under conditions of restricted head room and other restrictive physical characteristics of the building. Part of the system was installed in an open craneway to obtain an efficient operating layout. What Mahon has done in hundreds of manufacturing plants throughout the world, he is prepared to do for you also. If you are confronted now with a finishing problem involving new equipment, do not hesitate to call on Mahon engineers . . . remember, that twenty-seven years of experience in this highly specialized field, together with constant research and development, have endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon Insert in Sweet's Mechanical Industries File for complete information, or arrange consultation.

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MAHON

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JUNE 17, 1948

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A Set Of Spurs

ON his non-political tour to acquaint the people with the state of the union, Harry Truman stopped off at Grand Island, Nebraska. A genial crowd of well-wishers greeted him and, among other tokens of good will, presented him with a set of fancy spurs. The President grinned in genuine appreciation and quipped: "When I get them on I can take Congress to town."

It so happened that Harry had been doing a pretty fair job of riding herd on Congress before his thoughtful hosts presented him with a pair of handsome and formidable goads. According to the Presidential analysis, most of the ills afflicting this fair land could properly be laid at the door of Congress.

It is reasonable to assume that the country will not take this charge too seriously. Our people have a well-developed bump of tolerance for the vagaries and spleen of party leaders. They have particular sympathy for the President. He holds his position by accident. He is the heir of one of the master politicians of American history. His party is divided on issues that are well-nigh insoluble; a party which, as a result of the war, is holding power on borrowed time. If the English wearied of Churchill and the South Africans of Smuts, who is Harry Truman to thwart the desire of the public for a change?

In the unlikely probability that some of his listeners might take him seriously, it may be well to say a word for Congress. It has been the butt of burlesque humor and the target of the disappointed. Some of its members at times provide good material for cartoon and satire.

On the whole, however, Congress in this troubled period has turned in an outstanding performance. In some ways this tribute is deserved precisely because it has checked the President. When F.D.R. sought to reduce the Supreme Court to a rubber stamp, it was a stubborn and courageous Congress that saved the integrity of the Courts. When professional unioneers opposed the passage of the Taft-Hartley Bill, Congress made this measure law in spite of a Presidential veto. Harry Truman himself had occasion to invoke provisions of this law in dealing with John Lewis.

Congress has been slow in accepting the administration's program of European aid. Its deliberation and the conditions surrounding aid are entirely justified by the facts. Certainly our postwar foreign policy might have been less disappointing had Congress been consulted more frequently by the Chief Executive.

We should not forget, in the heat of a political campaign, that the founding fathers intended the national legislature to be one of three cardinal containers of political authority. Should the day ever come when Congress no longer has the power to annoy the President, it will mark a tragedy for the American people.

Joseph Stagg Lawrence

"I Like the UNIFORMITY of Inland Steel"

THE MEN WHO WORK
WITH INLAND STEEL
KNOW ITS QUALITY!

Enameling plant inpectors know how steel sheets that vary in chemical composition and physical properties can cause serious warpage problems. These men prefer steel that's *uniform*. That's why they like steel *made by Inland*. Uniform source of raw materials . . . uniform steelmaking procedures using the same modern equipment . . . uniform workmanship—made possible by Inland's completely integrated, closely knit plant—explain why the uniformity of the Inland steel received today will be the same as that received last month . . . or last year.

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IRON AGE
JUNE 15, 1948

NEWSFRONT

► Producers of openhearth alloy steels who were beating the bushes for business 6 months ago have been so swamped by orders that many are rationing customers. Delivery is now being promised in November and December.

► Although no official announcement has yet been made, General Electric is expected to take over the aircraft engine plant at Lockland, Ohio for the production of jet engines. The plant, containing 5,600,000 sq ft of floor space, was formerly operated by Wright Aeronautical Corp.

► As a part of its planning for national defense and emergency industrial mobilization, the National Security Resources Board has quietly instigated a survey of industrial productive capacity by types of machine tools. Both government and industry have been called upon for statistics.

► The new plant for the Swedish Fagersta Steelworks, estimated to cost about $5½ million, will raise the work's ingot capacity to 115,000 tons per year. The new facilities are expected to be ready for production early in 1949.

► Wear fatigue tests on ball bearings substantiate the fact that ½ pct molybdenum steels show better accelerated wear life than does the standard 52100 steel analysis.

► Mortality rate in the auto industry has been exceedingly high. A total of 1700 separate companies have participated in the production of automobiles. Today there are 12 producers of passenger cars only, 6 companies make cars and trucks and 16 produce trucks only. The ratio of survivorship is only 2 pct.

► An inspection device for jet blades, which will measure contours to one ten-thousandth of an inch or less, will be put on the market in the near future. The device reduces previous inspection time to a fraction and makes a permanent record of the dimensions of each blade inspected.

► There is little prospect for a decrease of French iron and steel prices. One reason is that prices on coal and coke appear likely to be further increased to meet higher costs of the nationalized mines. Furthermore, the rate of exchange on imported coal is expected to be changed from 120 francs to 214 francs to the dollar.

► Usually about this time steel producers begin to worry about the effects of vacations and hot weather on steel output. This year, as in the past 2 years, hot weather is expected to have a negligible effect on total output despite the fact that it was a definite factor years ago.

► Stylists in the automobile industry are at the moment engaged in heated controversy over the future of the socalled "fast" back (the long sloping back) vs the "bustle" back for passenger cars. One prominent manufacturer is reported to have a complete set of dies for a fast back car which may never be produced.

► The steel industry now stands practically alone in its anti-inflation fight. Many of steel's biggest customers have "broken the line" on either wage increases or prices for their products--or both. None of this has pleased the steel producers. Nor do they find any solace in the cost picture. Despite strong pressure, prices of things which the industry must buy are still rising. Reports of strong, sustained demand bring no smiles from those who have forsaken profits but feel they have received no thanks.

► In order to maintain its present rate of output the British aluminum fabricating industry considers that it will need 200,000 tons of imported aluminum in 1948. But full capacity operations would require much more than that.

► A manufacturer of jet blades has been able to reduce his die sinking time in half on forging dies through use of a new machine put on the market recently by a New England machine tool builder.

► Use of radioactive isotopes in gages for measuring the thickness of sheets of pliofilm has been perfected by engineers of a midwestern company. Mechanical gages were declared unsatisfactory for these measurements which average 0.001 in. The radioactive gage measures the pliofilm as it comes from the roll, with no contact necessary.

► Latest alloy being tested for steam locomotive staybolds, is a 1½ pct nickel, 1½ pct manganese alloy presently being tried in Pennsylvania Railroad engines.

Transfer Line Drills Ford Crankshafts

The need for speed and accuracy in drilling and reaming the deep lubrication holes in crankshafts at Ford Motor Co., resulted in the development of a special transfer-type drilling machine, utilizing step drilling, which produces 60 crankshafts per hr. The tooling and operating sequence are described in this article, along with many of the novel features of the line.

° ° °

By WALTER G. PATTON
Detroit Editor,
THE IRON AGE

° ° °

TO assure proper lubrication of bearings in its new V-8 engines Ford Motor Co. engineers have provided dual oil holes in the crankshaft. Because of the speed and the accuracy required in the deep drilling and reaming of these holes, special transfer-type drilling machine, utilizing step drilling, was specified. The machine was designed and built as a joint operation between the Ford Motor Co., H. R. Krueger Co., and the Snyder Tool & Engineering Co. Five such machine are in operation, three of which were built by Snyder and two by Krueger.

Production of 60 crankshafts an hr at 80 pct efficiency on a single line is possible with these machines, which drill all necessary oil holes in the crankshaft and ream two holes for the welch plugs.

Crankshafts are advanced in the unit through 28 operating stations by means of an index bar. The operations performed at each of the stations are shown in table I, and the entire transfer line is shown in fig. 1, looking from the unloading end. In the Snyder machines, the crankshafts pass under 24 Avey deep-hole units, vertically and angularly mounted, and eight horizontal W. F. & John Barnes Co., step-drilling units. All units are hydraulically actuated, and the deep-hole step-drilling unit retracks automatically when the drills become overloaded. The use of step drilling is said to give faster production, improved accuracy and better tool life than would be obtained if continuous drilling were used. The Krueger-built machines use Leland-Gifford step-drilling units.

High speed drills and reamers are mounted in standard adjustable sleeves to facilitate tool changing. Angularity of the drilling units can be changed in the event of engineering changes in the crankshafts..

The 28-station line is split into four sections, with stations 14 and 17 permanently idle to provide space for inspection and maintenance. The operational layout is shown in fig. 2. The hydraulically-operated shuttle on the Krueger and Snyder machines is designed so that it is possible to run the machines as four separate units, merely by adding an hydraulic cylinder and necessary linkage to each section.

Welded steel construction is used for the base

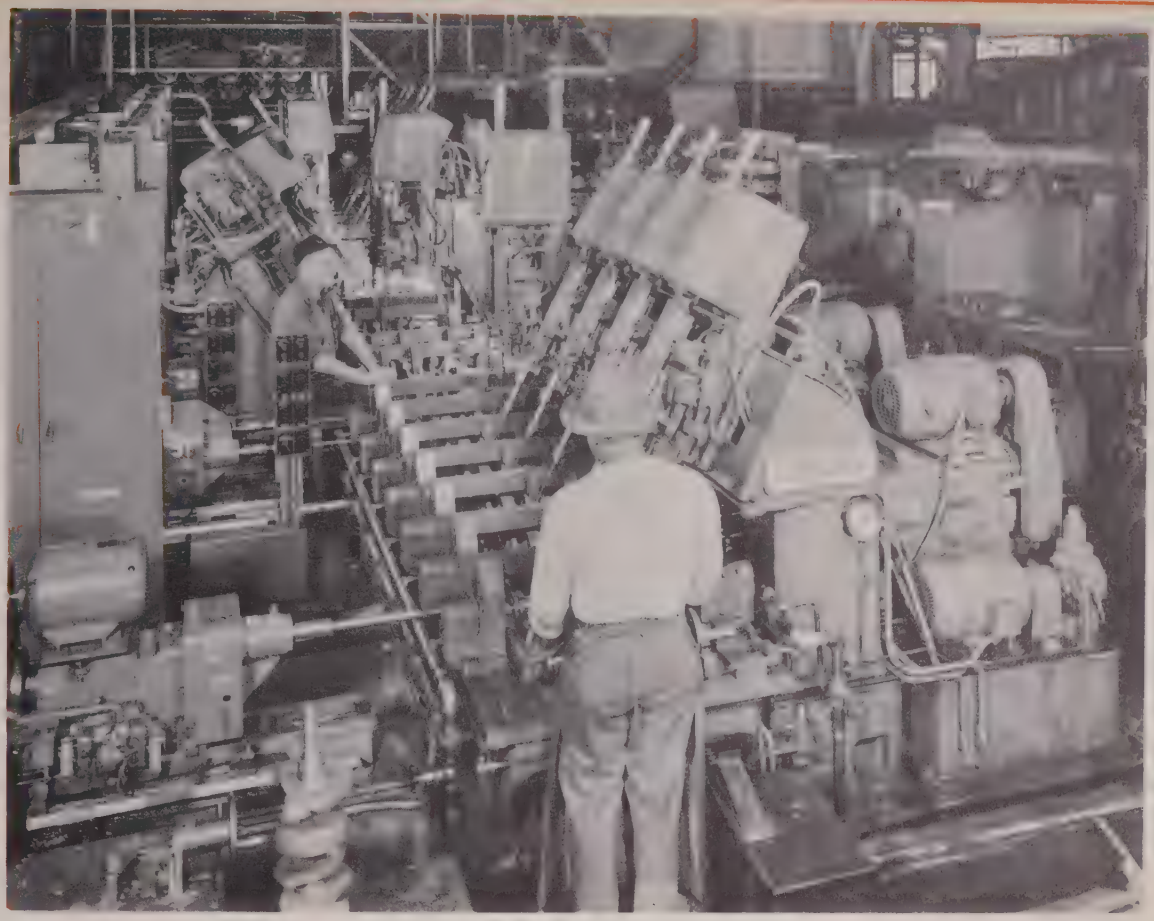


FIG. 1 - This shows the entire Mercury crankshaft drilling line, looking at it from the unloading end. The man in the far background is the loading operator.

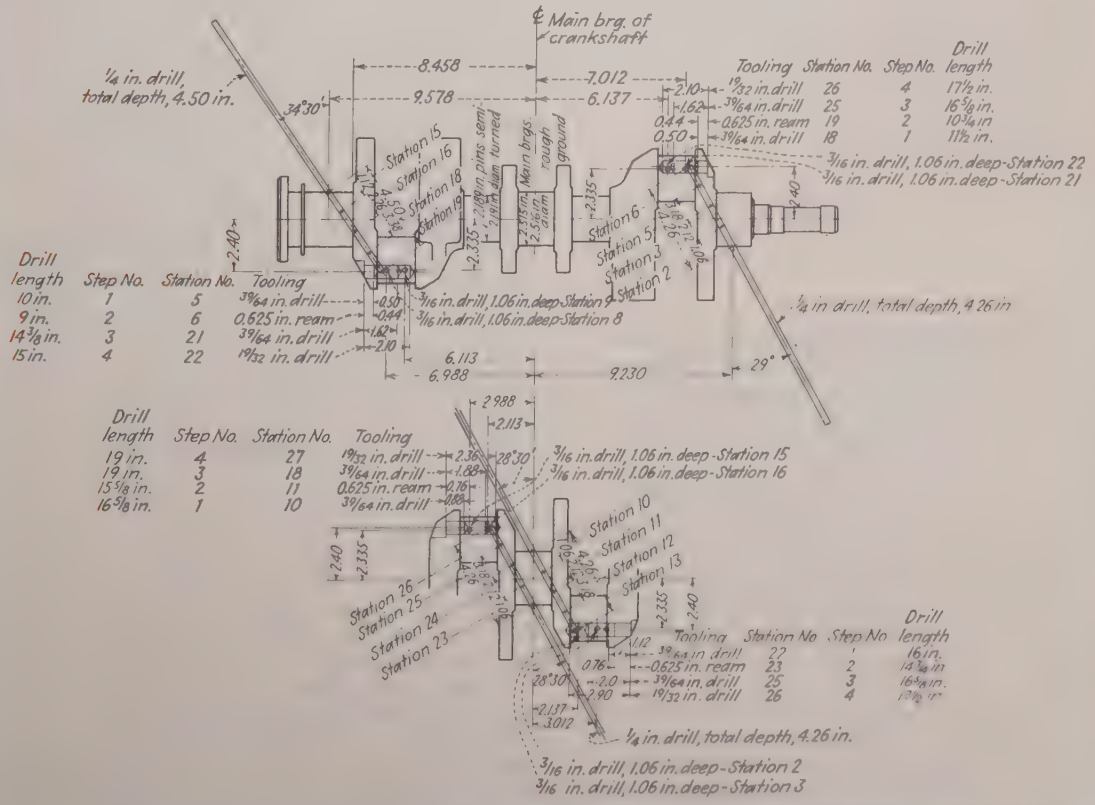

℄ Main brg. of crankshaft
1/4 in. drill, total depth, 4.50 in.
34°30'
8.458
9.578
7.012
6.137
Tooling Station No. Step No. Drill length
19/32 in. drill 26 4 17 1/2 in.
39/64 in. drill 25 3 16 5/8 in.
0.625 in. ream 19 2 10 3/4 in.
31/64 in. drill 18 1 11 1/2 in.
3/16 in. drill, 1.06 in. deep - Station 22
3/16 in. drill, 1.06 in. deep - Station 21
Station 15
Station 16
Station 18
Station 19
Station 6
Station 5
Station 3
Station 2
Drill length Step No. Station No. Tooling
10 in. 1 5 39/64 in. drill
9 in. 2 6 0.625 in. ream
14 3/8 in. 3 21 39/64 in. drill
15 in. 4 22 19/32 in. drill
3/16 in. drill, 1.06 in. deep - Station 8
1/4 in. drill, total depth, 4.26 in.
6.113
6.988
9.230
29°
Drill length Step No. Station No. Tooling
19 in. 4 27 19/32 in. drill
19 in. 3 18 39/64 in. drill
15 5/8 in. 2 11 0.625 in. ream
16 5/8 in. 1 10 39/64 in. drill
28°30'
3/16 in. drill, 1.06 in. deep - Station 15
3/16 in. drill, 1.06 in. deep - Station 16
Station 10
Station 11
Station 12
Station 13
Station 26
Station 25
Station 24
Station 23
Tooling Station No Step No Drill length
39/64 in. drill 22 1 16 in.
0.625 in. ream 23 2 14 3/8 in.
39/64 in. drill 25 3 16 5/8 in.
19/32 in. drill 26 4 17 1/2 in.
1/4 in. drill, total depth, 4.26 in.
3/16 in. drill, 1.06 in. deep - Station 2
3/16 in. drill, 1.06 in. deep - Station 3

FIG. 2 - Details of the tooling layout for drilling and reaming holes in crankshafts show the position of the crankshaft in relation to the tools at the various work stations.

FIG. 3 - Coolant and chips from this Mercury crankshaft drilling line drop to an endless chain-type conveyor that rests on the floor and is placed in an opening at the bottom of the machine base.

of each machine, and sections are bolted together to form a continuous machine base. The base carries the shuttle mechanism and 21 work-holding fixtures, as well as the four rails that index the part 90° after passing stations 7, 14, 20, and 23.

The base is constructed to permit passage of chips and coolants to the chip conveyor that runs the full length of the machine. The conveyor rests on the floor and is placed in an opening at the bottom of the base, as shown in fig. 3. The chip conveyor is of the endless chain-type and is motor-driven through a Link Belt speed reducer.

Four hydraulic pumps supply power to the step-drilling units on the Snyder machines. One pump is located at each machine section to operate the six step-drilling units in the section. The Krueger machines also employ one accumulator unit on each of the four sections. All machine spindles are made of heat treated AAA steel and are mounted on preloaded ball bearings. Standard adjustable adaptors are provided.

The work-holding fixture is carried on the base at each working station, and consists of two housings mounted on opposite sides of the transfer mechanism, with each housing containing an hydraulically-operated center. These centers advance to pick up the centered ends of the crankshaft. The center operating at the front end of the crankshaft is equipped with an hydraulically-actuated wedge which clamps the crankshaft against a positive stop, engaging the inside flange at the rear main bearing for endwise location. Radial location is accomplished by rails engaging the crank pins. Variations in these rails are designed to index the part 90° around its center line at four stations. This indexing is shown partly completed in fig. 4. Hydraulic power for operating the fixtures and the transfer mechanism is supplied by a Barnes B-4038 hydraulic unit. The floor space occupied by a drilling unit is 36½x14 ft.

The Ford crankshaft is made of No. 8 cast alloy, of the following composition: Carbon, 1.35 to 1.55 pct; manganese, 0.70 to 0.90 pct; silicon, 0.85 to 1.05 pct; chromium, 0.20 to 0.35 pct; molybdenum, 0.10 to 0.20 pct; copper, 0.50 to 1.00 pct; and nickel, 0.25 pct, max.

As received, the crankshafts are: Normalized at 1750°F, air-cooled to 1200°F, reheated to 1450°F, and furnace cooled to 1100°F. Specifications called for the material to meet a requirement of 241 to 286 Bhn.

Fig. 2 is a detailed diagram of the Ford crankshaft, showing the location and size of holes to

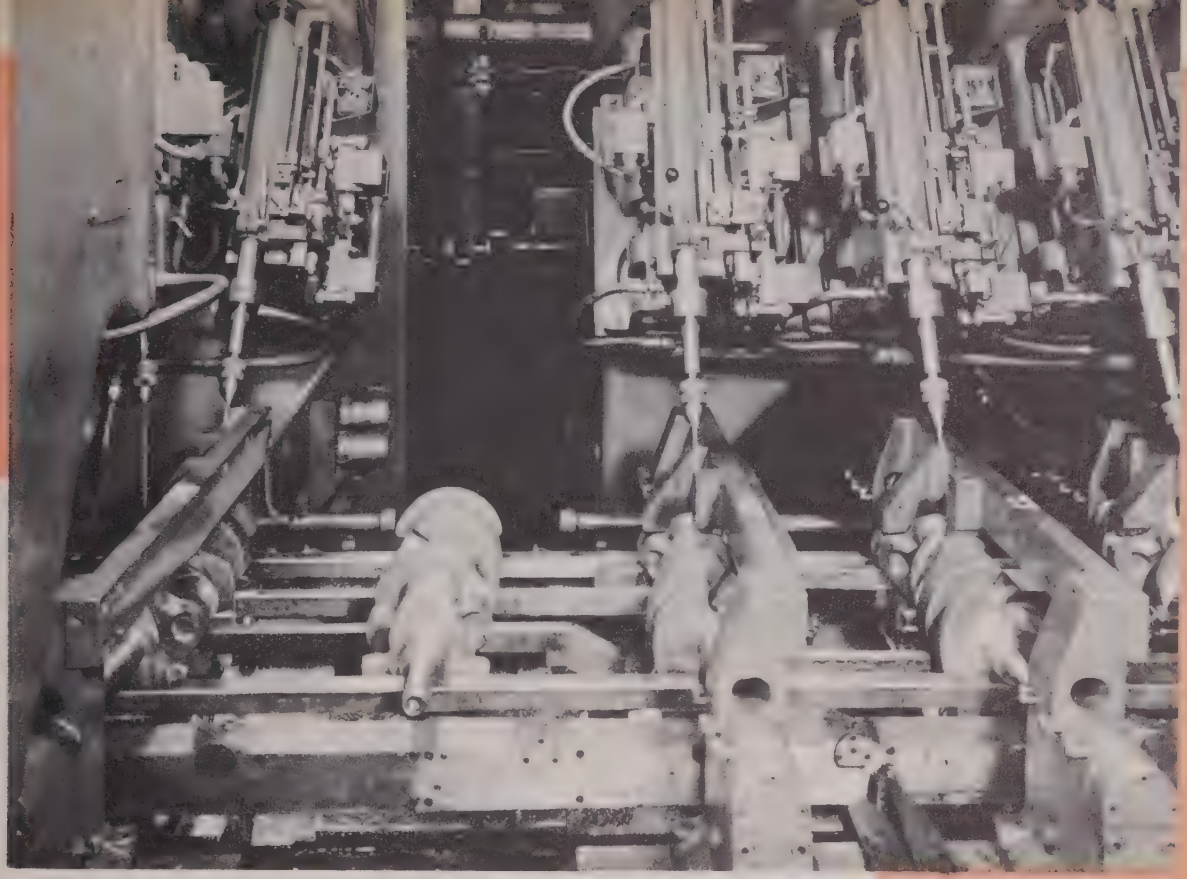


FIG. 4 - A 90° indexing of the crankshaft follows idle station No. 14. Rails engage the crank pins, and variations in the rail cause the crankshaft to index radially. The crankshafts shown here are moving through the indexing mechanism.

be drilled and the depth of cut taken at each station. The entire work cycle consists of 36 individual drilling operations and four reaming operations.

Section I consists of four angularly-mounted units at stations 2, 3, 5 and 6, carried on a welded steel column and mounted so that their location and angularity are adjustable. Two vertical step-drilling units are mounted on the opposite side of the machine at stations 2 and 3. These angularly and vertically mounted units are shown in fig. 5. The units are also carried on a welded steel column, adjustable for location and angularity. A horizontally-mounted Barnes SH-10, 18-in. stroke, self-contained hydraulic feed unit, carrying a two-spindle head, operates at stations 5 and 6. This is carried on a welded steel side wing.

Section II covers stations 8 through 13. At the rear of the second section two step-drilling units are mounted vertically on a welded steel column at stations 8 and 9. Four step-drilling units are mounted in an angular position at stations 10, 11, 12 and 13, which are carried on another welded steel column. A Barnes SH-10 hydraulic feed unit with an 18-in. stroke is mounted horizontally on a welded steel side wing. The unit carries a two-spindle head operating at stations 10 and 11.

On the front end of section III, two vertically-mounted step-drilling units are carried by a steel column at stations 15 and 16. A Barnes hydraulic unit, identical to those described, carries a two-spindle head, operating stations 18 and 19. On the opposite side of the machine, four angularly-mounted step-drilling units operate at stations 15, 16, 18, and 19. These units are carried on two welded steel columns. All six of the units in this section are mounted so that their location and angularity are adjustable. A Barnes SH-75 self-contained hydraulic-feed unit with an 18-in. stroke and a single-spindle head is mounted horizontally at station 18.

A welded steel bridge-type column running from station 21 to station 26 is located on the front side of section IV. Two step-drilling units are mounted vertically at stations 21 and 22 and four step-drilling units are mounted angularly at stations 23, 24, 25 and 26, all being carried on the same column. Two Barnes SH-10 hydraulic-feed units are mounted horizontally on the welded steel side wings. One unit carries a two-spindle head operating at stations 22 and 23, while the other unit carries a four-spindle head mounted at stations 25 and 26.

On the opposite side of the base are horizon-

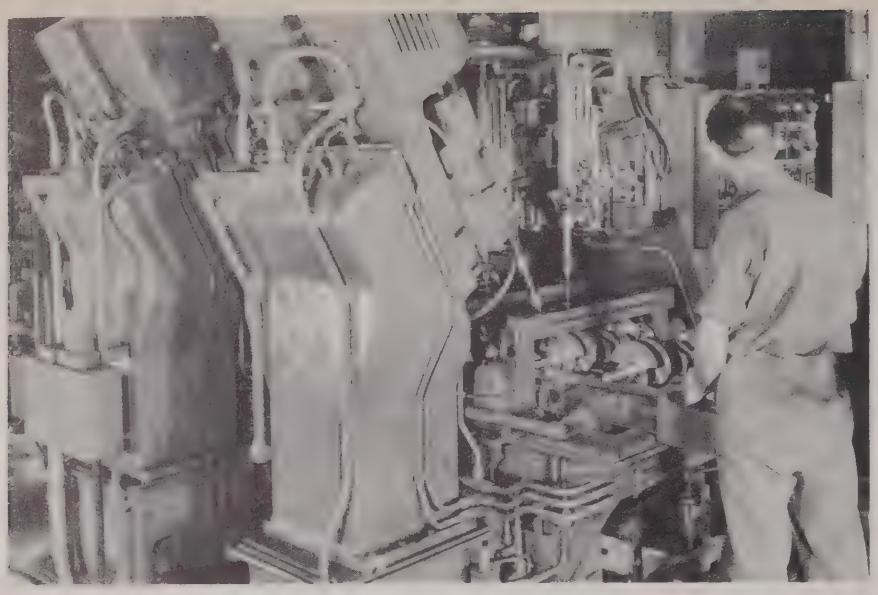


FIG. 5 - View from the loading station. The two vertical step-drilling units in the right background and the two angularly-mounted units of stations 2 and 3 can be seen. Mercury crankshafts are being loaded on the line.

tally-mounted an SH-10 Barnes and an SH-75 Barnes hydraulic-feed unit, both with 18-in. strokes. Each unit is carried on a welded steel side wing. The SH-10 unit has a two-spindle head, operating at stations 21 and 22, and the SH-75 unit has a single-spindle head operating at station 27. Each section of the machine has an individual control panel so that the sections can be operated by themselves. Each of the panels is tied into a master panel, controlling the entire machine.

TABLE I Operations Performed at 28 Stations on Ford Crankshaft Drilling Line

Station No.	Operation
1	Loading Station
2	Drill angular hole in front main bearing, ¼ in. diam x 1.06 in. deep. Drill bleeder hole in No. 2 crankpin, 3/16 in. diam x 1.06 in. deep.
3	Increase depth of angular hole in front main bearing to 2.12 in. Drill bleeder hole in No. 2 crankpin, 3/16 in. diam x 1.06 in. deep.
4	Idle Station
5	Increase depth of angular hole in front main bearing to 3.18 in. Drill sludge hole in No. 4 crankpin, 39/64 in. diam x 0.5 in. deep.
6	Increase depth of angular hole in front main bearing to final depth, 4.26 in. Ream sludge hole in No. 4 crankpin, 0.625 in. diam x 0.44 in. deep.
7	Idle station Index part 90°
8	Drill bleeder hole in No. 4 crankpin, 3/16 in. diam x 1.06 in. deep.
9	Drill bleeder hole in No. 4 crankpin, 3/16 in. diam x 1.06 in. deep.
10	Drill angular hole from rear side in center main bearing, ¼ in. diam x 1.06 in. deep. Drill sludge hole in No. 3 crank pin, 39/64 in. diam x 0.88 in. deep.
11	Increase depth of angular hole in center main bearing to 2.12 in. Ream sludge hole in No. 3 crankpin, 0.625 in. diam x 0.76 in. deep.
12	Increase depth of angular hole in center main bearing to 3.18 in.
13	Increase depth of angular hole in center main bearing to final depth, 4.26 in.
14	Idle station Index part 90°
15	Drill angular hole in rear main bearing ¼ in. diam x 1.12 in. deep. Drill bleeder hole in No. 3 crankpin, 3/16 in. diam x 1.06 in. deep.
16	Increase depth of angular hole in rear main bearing to 2.26 in. Drill bleeder hole in No. 3 crankpin, 3/16 in. diam x 1.06 in. deep.
17	Idle station
18	Increase depth of angular hole in rear main bearing to 3.38 in. Drill sludge hole in No. 3 crank pin, 39/64 in. diam x 1.88 in. deep. Drill sludge hole in No. 1 crankpin, 39/64 in. diam x 0.50 in. deep.
19	Increase depth of angular hole in rear main bearing to final depth, 4.50 in. Ream sludge hole in No. 1 crankpin, 0.625 in. diam x 0.44 in. deep.
20	Idle station Index part 90°
21	Drill bleeder hole in No. 1 crankpin, 3/16 in. diam x 1.06 in. deep. Drill sludge hole in No. 4 crankpin, 39/64 in. diam x 1.62 in. deep.
22	Drill sludge hole in No. 2 crankpin, 39/64 in. diam x 1.12 in. deep. Drill bleeder hole in No. 1 crankpin, 3/16 in. diam x 1.06 in. deep. Drill sludge hole in No. 4 crankpin, 19/32 in. diam x 2.10 in. deep.
23	Drill angular hole in center main bearing from front, ¼ in. diam x 1.06 in. deep. Ream sludge hole in No. 2 crankpin, 0.625 in. diam x 0.76 in. deep.
24	Increase depth of angular hole in center main bearing to 2.12 in.
25	Increase depth of angular hole in center main bearing to 3.18 in. Drill sludge hole in No. 2 crankpin, 39/64 in. diam x 2 in. deep. Drill sludge hole in No. 1 crankpin, 39/64 in. diam x 1.62 in. deep.
26	Increase depth of angular hole in center main bearing to 4.26 in. Drill sludge hole in No. 1 crankpin, 19/32 in. diam x 2.10 in. deep. Drill sludge hole in No. 2 crankpin, 13/32 in. diam x 2.90 in. deep. Index part 90°
27	Drill sludge hole in No. 3 crankpin, 19/32 in. diam x 2.36 in. deep.
28	Unloading station

Arc Welding Red Brass

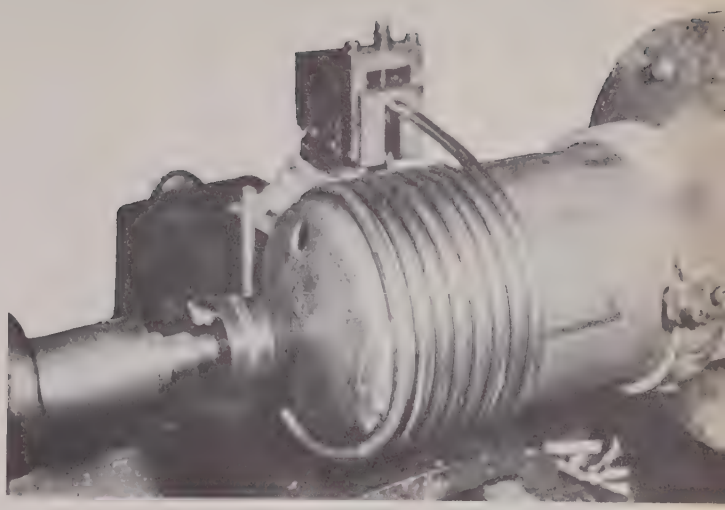


FIG. 1 - Following wrapping of the refrigerant coil around the deep drawn tank, the tank and coils are dipped in hot tin.

° ° °

By LOUIS P. BENUA
Vice-President and General Works Manager
Ebco Mfg. Co., Columbus, Ohio

° ° °

Difficulties arising from the fact that components in red brass oxidize at high temperatures necessitated the establishment of a welding procedure for the fabrication of a tank and cooling assembly for an electric drinking water cooler. By using automatic helium shielded carbon arc welding, rejections were reduced 75 pct and the burst strength of the tank was doubled. This welding technique is described in this article.

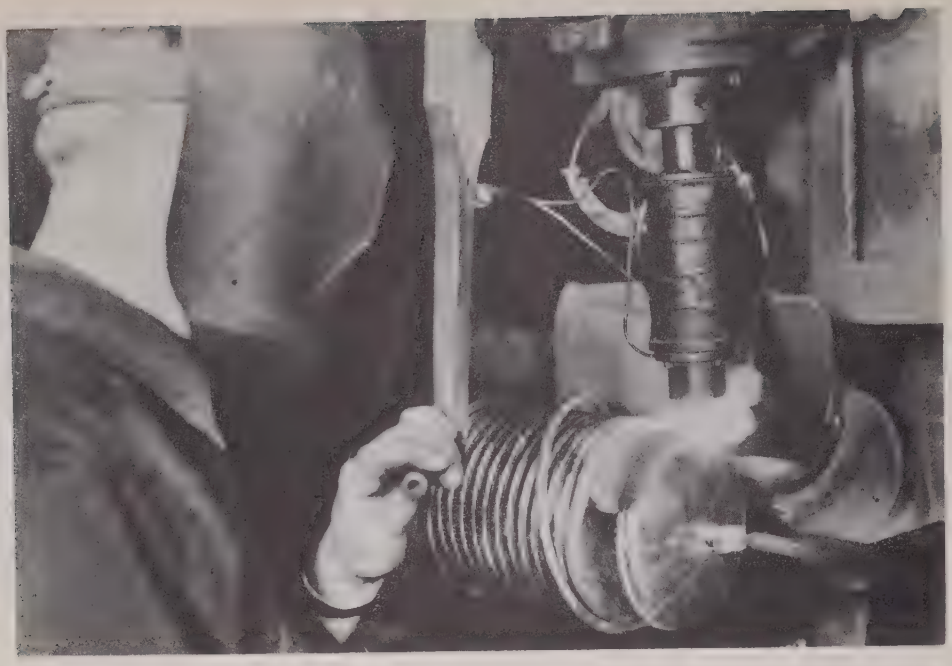
• • •

WELDING red brass is complicated by vaporization and oxidation of certain elements, chiefly zinc, which causes weld porosity. Material specifications of the tank and cooling coil assembly on an electric drinking water cooler made by Ebco Mfg. Co., were recently changed to 85-15 red brass (85 pct copper and 15 pct zinc). The change in material immediately presented a problem in welding the heads onto the deep drawn tanks.

An automatic carbon arc welder was available in the plant and, because it had been successfully used in welding the heads on galvanized steel cans it was decided that the unit could be adapted to welding the red brass tanks. A setup was first tried using a flux in welding. A setup was later developed for using the welder without flux and with helium gas for shielding. Rejections for pin holes were reduced 75 pct of what they had been when welding with a flux, and the burst strength of test samples was doubled.

Welding the heads involved fusing 1 1/16-in. wide by 0.050-in. thick flanges on both the head and the tank. The diameter of the tank is 6 5/16 in. and before welding the material is heavily tinned.

Since there is little available published information and apparently little experience with the carbon arc welding of red brass, it was necessary to start at the beginning and develop procedures. To be assured of the feasibility of the welding



ABOVE

FIG. 2 - The head is welded to the tank with the carbon arc Lincoln Tornado head using helium for shielding. The weld is made joining the 1/16 in. flanges on the tank and head. The water cooled, stainless steel nozzle that directs carbon and gas to the work is seen directly above the arc.

• • •

before developing the design of the tank, a few pieces were first welded by hand. The results appeared satisfactory so it was decided to proceed with tooling.

When production was first started with the automatic carbon arc process using a flux, considerable difficulty was experienced because of pin holes in the welds. By using a baffle in the tank as a backing strip for the weld and changing the flux to a home-made mixture of two commercial brands, rejections were eventually cut down to where the manufacture of these tanks became economical.

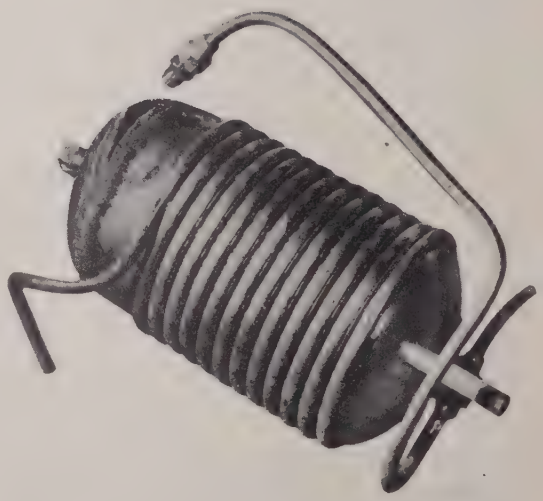
The process, however, was not completely satisfactory and inert gas shielded arc welding was tried. With a few changes, the Lincoln Tornado automatic carbon arc unit was adapted for use with helium gas.

An austenitic stainless steel water-cooled nozzle was made to fit the boot of the Tornado welder through which both the gas and the carbon electrode is directed onto the work. It was necessary to use austenitic stainless steel since the purpose of the Tornado boot is to create an electro-magnetic field which is used to stabilize the arc. The non-magnetic properties of the stainless permitted its use without disturbing the function of the boot.

In welding the head to the tank by the inert gas shielded arc method the 85-15 red brass tank is placed in a special lathe where the refrigerant tubing is wrapped around it. This operation is shown in fig. 1. The tank and coil then are hot tinned by dipping and are ready for welding.

BELOW

FIG. 3 - Failure in this welded tank occurred at 1100 psi.



The head for the tank, which is also hot tinned, is clamped to the tank in a power driven welding fixture so that the flanges come directly under the carbon electrode. The fixture rotates the assembly under the welding head as the weld is made, as shown in fig. 2. The arc is struck at a reduced amperage and the cooling tank is started rotating at a speed of approximately 15 ipm. In order to compensate for the heat that builds up in this light tank, the speed of rotation is gradually increased during the welding cycle. In this way a uniform weld with good penetration is obtained.

The inert gas is consumed at the rate of 10 liters or 4.2 cu ft per min. A solenoid valve, operated by a cam on the driving mechanism of the fixture, controls the flow of gas delivered by the nozzle. The nozzle is close to the work to provide the protective gas envelope. The carbon electrodes are 5/16-in. diam and welding is done at 150 amp using from 18 to 20 v. The welding

cycle is 1 min, 7 sec. At present, production is about 160 units every 8-hr shift.

Welding with inert gas and the carbon arc, according to the procedures outlined, has produced highly satisfactory results. Because of the deeper penetration obtained and the stronger welds made, the bursting strength of the tanks has been raised from 500 to 1000 psi. The tank shown in fig. 3 burst at 1100 psi.

Furthermore, the tin coating readily melts and flows down over the bead. Relatively inexpensive carbon electrodes are used and they last ten times as long than when the job was done with flux.

Acidic Emulsion Cleaner for Zinc Base Diecastings

SAVINGS in the cost of cleaning zinc base diecastings prior to electroplating and the virtual elimination of rejects due to blistering, on baking, of the plate from the base metal have resulted from the use of Dykasol, an acidic emulsion cleaner, by several companies doing automotive part and plumbing fixture electroplating in the Detroit area.

The cleaner was first used over a year ago in replating stripped castings. In this application a Dykasol soak was found to permit 90 to 95 pct reclamation where previously anything over 50 pct had been considered good. Used as a step in regular plating lines, the cleaner has eliminated the need for vapor degreasing in many cases and has made the wiping of castings after buffing unnecessary.

Dykasol, a strong acid emulsion, and Dykasol Replenisher, a non-acidic emulsion, are added to water in about 10 pct concentrations to prepare a solution having a maximum degreasing as well as a metal conditioning effect. When used behind a vapor degreaser, Dykasol is generally used at 20 pct concentration, with no replenisher.

Continental Die Casting Corp. Div., F. L. Jacobs Co., Holly, Mich., reports it has reduced cleaning costs substantially by eliminating the need for wiping after buffing. For buffing, a liquid compound is used with none applied on the last wheel. The work is then given a 45 sec to 1 min soak in a Dykasol bath maintained at 140°F and put through a washer where for approximately 1 min it is sprayed with an alkaline solution—2 oz per gal of Miller's No. 26—at 180°F. The cleaning cycle is completed by an anodic cleaning for 45 sec at 180°F in Wyandotte No. 147 at a concentration of 6 oz per gal.

Using this treatment Continental requires no vapor degreaser and has eliminated blistering of the plate from the base metal even though many of the pieces—which are subsequently painted—are baked at 300°F for 45 min in the automotive plants.

The cleaner is kept in a lead lined, 140-gal tank and solution life has been found to average about 1 week with the bath handling roughly 6000 sq ft of casting surface area per day.

At the Packard Motor Car Co., Detroit, where Dykasol was first used, intricate shaping of the car grilles often resulted in residue from buffing compounds, finger prints from handling or other contaminants remaining after vapor degreasing. These were often not dissolved free by alkaline cleaners, and as a result about 5 pct of the pieces were rejected after baking because of blistering of the plate from the base metal. Since adding Dykasol to the plating line, rejections from this cause have been reduced to less than 0.5 pct.

Reclamation of rejects has proved about 90 pct successful at Packard. The stripped castings are degreased and given a 2 min soak—fresh pieces get 30 sec—in a 20 pct solution. The acid etches the metal, leaves an activated surface which has been found to improve the covering power of the copper strike, and effectively removes the loose, dust-like sediment which usually remains on the surface of stripped castings and is the prime hindrance to replating success.

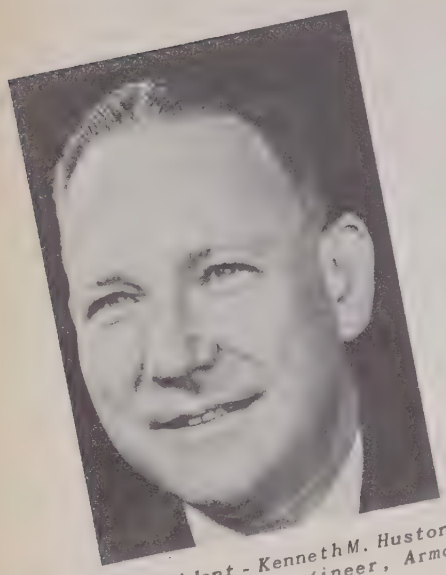
Life of the bath at Packard—400 gal in a lead lined tank—runs about 2 weeks with 4680 sq ft per day being handled. As at Continental, mechanical stirring is being used in the tank as air agitation was found to shorten bath life to only 1 week. This adverse effect of air agitation seems to be associated with breaking of the emulsion, possibly at least in part because of volatilization of the solvent.

At Gerity-Michigan Corp., Adrian Div., Adrian, Mich., a Dykasol soak has been incorporated as a cleaning step in a semiautomatic Hanson-Van Winkle-Munning machine used for copper plating prior to nickel. Previously the use of solvent type cleaner on this line had allowed solvents and oil to be carried into the plating tanks in dead end cavities in the castings and in ruptures in rack coatings. This had necessitated occasional down time for purification of the contaminated solutions. The expense of the down time and the purification processes have been eliminated by the use of the Dykasol material.

The cleaner is also used at Gerity-Michigan as an auxiliary cleaner to handle stripped zinc base diecastings as part of a fully automatic Crown plating machine. This step has cut the loss on replated castings from a previous 45 pct to less than 5 pct.

One limitation on the use of the solution is that for zinc base alloys containing more than 1 pct Cu, cleaning has not been successful. About 80 pct of the casting done, however, is with Zamak 3 which carries a maximum of 0.03 pct Cu, so that the limitation applies only where Zamak 5, 0.75 to 1.25 pct Cu, and special high copper alloys are used.

AES Meeting to Feature New



AES President - Kenneth M. Huston, senior research engineer, Armco Steel Corp., Baltimore.

Chairman Convention Committee - Horace H. Smith, president, Surety Electroplating Co., Newark, and former president AES.

Chairman Industrial Finishing Exposition - George Wagner, owner, Hy-Grade Electroplating Co., Newark.

List of Exhibitors Industrial Finishing Exposition

Booth Numbers Shown in Parentheses

Acme Mfg. Co. (52, 53, 54)
AES Research Committee (19, 20)
Allied Research Products, Inc. (131)
Almco, Div. Queen Stove Works, Inc. (69)
Alpha Metals, Inc. (16)
Alsop Engineering Corp. (51)
American Buff Co. (170, 171)
American Chemical Paint Co. (106)
American Instrument Co., Inc. (17)
Automotive Rubber Co., Inc. (154)
Bart-Messing Corp. (119, 120)
Beacon Supply Co. (15)
Behr-Manning Corp. (155, 156)
Belke Mfg. Co. (38, 39)
G. S. Blakeslee & Co. (162, 163)
Buckingham Products Co. (179, 180)
Chemical Corp. (116)
Chromium Engineers Inc. (41)
Commercial Filters Corp. (166)
Co-Operative Industries, Inc. (151)
Crown Rheostat & Supply Co. (60, 61)
Daniels Plating Barrel & Supply Co. (104)
Darco Corp. (27)
Detrex Corp. (67, 68)
Diversey Corp. (30, 31)
Divine Brothers Co. (25, 26)
Duggan Masking Devices (35)
Duluth Buff Co. (141)
Electric Products Co. (36, 37)
Enthone, Inc. (22)
Finishing Publications, Inc. (29)
Formax Mfg. Corp. Plant No. 2 (122)
Gardner Publications, Inc. (42, 43)
General Chemical Div., Allied Chemical & Dye Corp. (40)
General Electric Co. (12, 13)
Gold, Inc. (177, 178)
W. Green Electric Co., Inc. (62)
Frederick Gumm Chemical Co., Inc. (132, 133)
Hammond Machinery Builders, Inc. (142, 143, 144)
Hanson-Van Winkle-Munning Co. (5)
Haveg Corp. (118)
R. O. Hull & Co., Inc. (45)
Industrial Electroplating Co. (11)
Industrial Filter & Pump Mfg. Co. (65)
International Nickel Co., Inc. (79, 80, 81)
The Iron Age (34)
Jackson Buff Corp. (102, 103)
Kocour Co. (18)
LaSalco, Inc. (181, 182)
Lea Mfg. Co. (32, 33)
Chas. F. L'Hommedieu & Sons Co. (55)
Magnaflux Corp. (126)
Magnus Chemical Co., Inc. (158, 159)
Matchless Metal Polish Co. (152, 153)
Midwestern Mfg. Corp. (172)
Minnesota Mining & Mfg. Co. (70)
Munning & Munning, Inc. (63, 64)
Nelson Chemical Corp. (149)
Oakite Products, Inc. (127, 128)
Optimus Equipment Co. (4)
Paper Novelty Mfg. Co. (121)
Pennsylvania Salt Mfg. Co. (136, 137)
Plating (66)
Plating Products Co. (24)
Porter-Cable Machine Co. (129, 130)
Republic Industries, Inc. (49)
Reynolds-Robson Supply Co. (157)
James H. Rhodes & Co. (28)
Ronci Machine Co. (140)
Solventol Chemical Products, Inc. (112, 113)
Sparkler Mfg. Co. (23)
Special Chemicals Corp. (9)
Standard Electrical Tool Co. (101)
Standard Plating Rack Co. (117)
Frederick B. Stevens, Inc. (57, 58)
Sturgis Products Co. (164)
Sylvania Plastics Co. (44)
Technical Process Div. of Colonial Alloys Co. (145)
Technical Publishing Co. (21)
Titeflex, Inc. (77, 78)
H. O. Treice Co. (138)
Udylite Corp. (167, 168, 169)
United Chromium, Inc. (123, 124, 125)
U. S. Control Laboratories, Inc. (48)
U. S. Stoneware Co. (71, 72, 73)
Wagner Brothers, Inc. (134, 135)
Waverly Petroleum Products Co. (139)
Wico Metal Products Co. (114)

Plating and Finishing Methods

AN interesting schedule of technical sessions has been announced for the 35th annual convention of the American Electroplaters' Society to be held in Atlantic City, June 28 to July 1. In conjunction with the meeting, an Industrial Finishing Exposition sponsored by the AES will be held on the same dates.

Twenty papers, listed in the accompanying schedule, have been selected for presentation. The Herminie Dorothea Proctor Award will be made for the best paper presented and the Founder's Gold Medal is to be given for the best paper presented by a member of the Society.

Two other prizes, the AES Gold Medal and a $50 cash prize, will be awarded for the best papers printed during the year in Plating Magazine.

The Industrial Finishing Exposition will be held in the Atlantic City Convention Hall with approximately 100 manufacturers and suppliers exhibiting electroplating and metal finishing products.

A special business session for preliminary discussion of a new constitution and amendment recently proposed by the Newark Chapter is scheduled for Wednesday evening, June 30. The annual banquet, at which winners of the awards will be announced, will be held on Thursday evening, July 1.

Horace H. Smith, president, Surety Electroplating Co., Newark, is serving as chairman of the convention committee. Kenneth M. Huston, senior research engineer, Armco Steel Corp., Baltimore, is the incumbent president of the AES, and Samuel S. Johnston, technical director of the electrolytic department, Weirton Steel Co., Weirton, W. Va., is the first vice-president of the Society, and will take over the presidency at the termination of the convention. George Wagner, owner of Hy-Grade Electroplating Corp., Newark, is serving as chairman for the Industrial Finishing Exposition.

All technical sessions will be held in the ballroom on the second floor of the Convention Hall. Place of registration and convention general headquarters will be the Ambassador Hotel.

AES Program of Technical Sessions, 35th Annual Convention,

Atlantic City, June 28 to July 1

MONDAY, JUNE 28

2:00 to 4:30 p.m.

"Industrial Electropolishing"— Dr. C. L. Faust, Battelle Memorial Institute.

"Electropolishing Silver in Cyanide Solutions"—Daniel Gray, Oneida, Ltd.

"Diaphragm Tanks to Eliminate Roughness in Copper Plating" — R. H. McCahan and C. E. MacKinnon, E. I. duPont de Nemours and Co.

"Oxidation of Trivalent Chromium in Chromic Acid Plating Baths"— R. Seegmiller and V. Lamb, National Bureau of Standards.

TUESDAY, JUNE 29

9:30 a.m. to 12:00

"Description, Design and Production Costs of Conveyorized Spray Finishing System"— E. P. Schwartz, L. C. Smith-Corona Typewriter Corp.

"Electroplaters Metals of the Future"— F. A. Lowenheim, Metal and Thermit Corp.

"Importance of Acid Ratio in the Phosphatization of Steel"— N. F. Murphy and M. A. Streicher, Dept. of Chemical Engineering, Virginia Polytechnic Institute.

"Metal Cleaning"—G. B. Hogaboom, Consultant.

WEDNESDAY, JUNE 30

9:30 a.m. to 12:00

"Circulating Electrolyte Cell for Strip Plating Evaluation"— R. A. Dimon, Carnegie-Illinois Steel Corp.

"Bright Barrel Plating of Nickel and Zinc"—L. A. Chesworth, United-Carr Fastener Corp.

"Plating Copper - Zinc Alloys" — A. K. Graham, Graham, Crowley & Associates.

"Deposition of Metals on Plastics Employing Reduced Copper Films" —Dr. Harold Narcus, Electrochemical Industries, Inc.

WEDNESDAY, JUNE 30

2:00 to 4:30 p.m.

"Judging the Quality of Plated Parts"—W. M. Phillips and F. L. Clifton, General Motors Corp.

"Practical Methods of Cost Finding and Estimating on Metal Finishes" —Adolph Bregman, Consultant.

"Spiral Contractometer, a New Instrument for the Measurement of Stress in Electrodeposits"— Abner Brenner and Seymour Senderoff, National Bureau of Standards.

"Engineering Planning in the Plating Room"— S. M. Martin, United Chromium, Inc.

THURSDAY, JULY 1

9:30 a.m. to 12:00

"Some Effects of Copper As An Impurity in Nickel Plating Solutions and Its Effect on the Salt Spray Resistance of Nickel and Chromium Deposits on Steel"—D. T. Ewing and Robt. Rominski. (Project 5).

"Determination of the Porosity and Corrodibility of Electrolytic Metal Foils"—N. Thon and D. K. Kelemen. (Project 6).

"Effect of Internal Stress on Thickness Determination by the Jet Method"—H. J. Read. (Project 7).

"Physical Properties of Nickel Deposits"— Abner Brenner and C. W. Jennings. (Project 9).

Evaluating Hydrogen

By M. ROSENFELD
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IN acid pickling, two undesirable effects commonly recognized are: metal attack and hydrogen embrittlement. This article is concerned with the study of hydrogen embrittlement effects of solutions that readily remove rust; namely, 3.6 N sulfuric acid at 175°F and 4.8 N hydrochloric acid at 77°F, both uninhibited and inhibited against metal attack.

The objectives of the investigation were:

(1) To determine the most satisfactory acid solution under the conditions indicated.

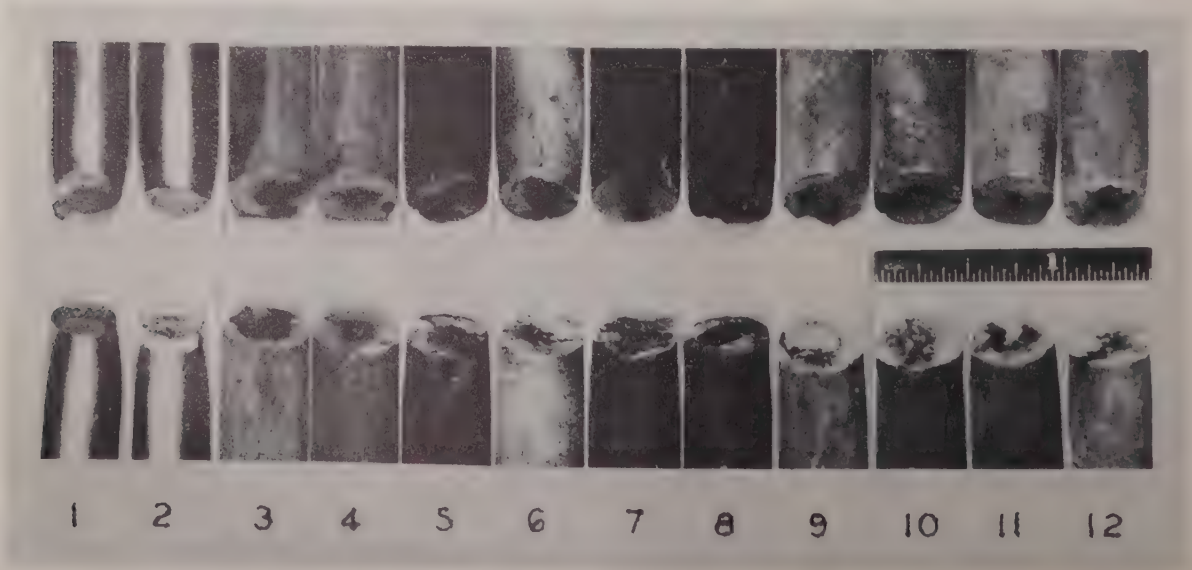
(2) To improve available inhibitors so that detectable embrittlement could be avoided or converted to embrittlement readily removable by subsequent treatment.

(3) To prepare inhibitors which would prevent observable embrittlement so that removal of hydrogen would not be necessary.

The standard tensile test was used in studying the extent of hydrogen embrittlement, since it enables rapid recognition of intense, partial, or absence of penetration of embrittlement. The percent reduction in area was used as a measure of the ductility and embrittlement of the material. Prevention of embrittlement refers to such prevention only insofar as it can be recognized by this test.

The study was restricted to three grades of cold finished steel: SAE 1020, SAE 1095 and molybdenum silicon steel. Round bars, ½ in. diam, were cut to 12-in. lengths, and, insofar as possible, comparisons were made on specimens from the same bar. Short bars were checked for chemical composition and hardness similarity. All specimens for embrittlement test were subjected to pickling processes preceded and followed by cleansing and drying. Promptly on

FIG. 1 - Effect of pickling specimens of SAE 1020 steel, ½ in. diam, and 12 in. long, in uninhibited and inhibited sulfuric acid at 175°F for 90 min. Specimens 5 and 6 have been boiled in water for 10 min, subsequent to pickling.



Embrittlement in Acid Pickling

Employing the standard tensile test as a means of studying the extent of hydrogen embrittlement in steel arising from acid pickling, the author is able to evaluate the embrittlement effects as caused by hydrochloric and sulfuric acids. The ability to minimize embrittlement by immersion in boiling water after pickling and by the use of various reagents in the pickling acids, is discussed quantitatively. An interesting correlation is presented whereby physical property values, indicating embrittlement effect, are associated with visual examinations of fractured specimens.

drying, the tensile specimens were tested at a load application rate of 10,000 lb per min, up to 3 min, then reduced to 1000 lb per min. These rates are well within the test requirements for Federal Specification QQ-M-151a.

Pickling was performed separately for each specimen by inserting it into a vertically held test tube 1 in. in diam and 15 in. long, followed by filling of the tube with a solution to submersion of the specimen. The pickling with hydrochloric acid solutions was for 90 min at 77°F, and for other solutions 90 min at 175°F. Preparation of specimens consisted of swabbing with naphtha followed by acetone and water washes and air drying; the after-pickling treatment was by water, then alcohol washes and air drying.

Samples subjected to boiling after treatment were prepared and air-dried as above followed by a 10-min boil, then water washed and subsequently alcohol washed and air-dried.

The commercial inhibitors are code designated

FIG. 2 - Effect of pickling specimens of SAE 1020 steel, ¼ in diam and 12 in. long, in sulfuric acid at 175°F for 90 min. Specimens 3 through 10 have been boiled in water for 10 min subsequent to pickling.

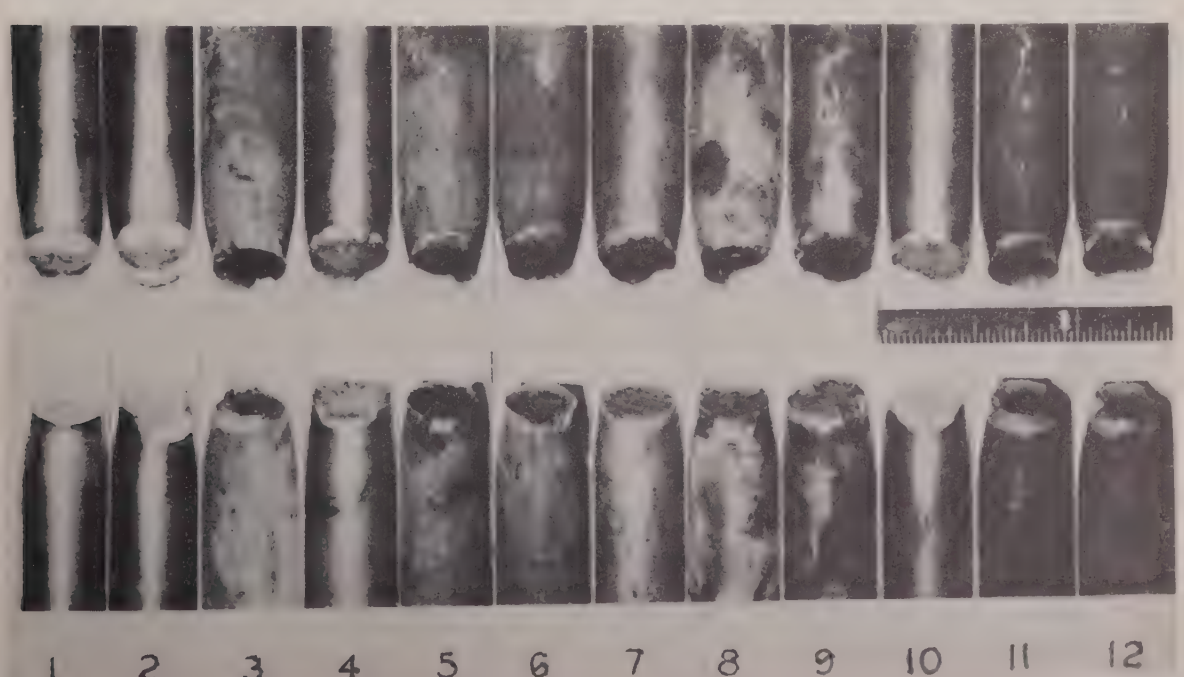


TABLE I

Effect of picking specimens of SAE 1020 Steel, ½ in. diam and 12 in. long, in sulfuric acid at 175°F for 90 min.

	SOLUTION	Inhibitor	Tensile Strength, Psi	Reduction of Area, Pct (Ductility)	Loss of Ductility, Pct
Fig. 1					
1	Blank	None	95,410	46.4	0
2	Blank	None	95,660	47.4	0
3	Sulfuric acid, 3.6N	None	95,050	14.6	68.9
4	Sulfuric acid, 3.6N	None	95,570	18.2	61.2
5	Sulfuric acid, 3.6N[1]	None	94,850	32.5	30.7
6	Sulfuric acid, 3.6N[1]	None	94,040	27.5	41.4
7	Sulfuric acid, 3.6N	A, 0.1%	94,390	20.4	56.5
8	Sulfuric acid, 3.6N	C, 0.1%	95,150	22.4	52.2
8a	Blank	None	94,900	49.0	0
8b	Blank	None	94,390	48.5	0
9	Sulfuric acid, 3.6N	Formaldehyde, 1%	92,860	23.0	52.8
10	Sulfuric acid, 3.6N	Formaldehyde, 1%	92,050	20.0	59.0
11	Sulfuric acid, 3.6N	Quinoline, 1%	92,230	25.4	47.9
12	Sulfuric acid, 3.6N	Quinoline, 1%	91,970	25.4	47.9
Fig. 2					
1	Blank	None	89,340	53.3	0
2	Blank	None	87,180	51.3	0
3	Sulfuric acid, 3.6N[1]	Formaldehyde, 1%	88,660	50.0	(4.4)[2]
4	Sulfuric acid, 3.6N[1]	Formaldehyde, 1%	89,430	51.5	(1.5)[2]
5	Sulfuric acid, 3.6N[1]	Quinoline, 1%	88,080	49.7	(5.0)[2]
6	Sulfuric acid, 3.6N[1]	Quinoline, 1%	88,860	50.3	(3.8)[2]
7	Sulfuric acid, 3.6N[1]	A, 0.1%	90,430	40.1	23.3
8	Sulfuric acid, 3.6N[1]	A, 0.1%	89,340	41.6	20.5
9	Sulfuric acid, 3.6N[1]	C, 0.1%	89,850	38.6	26.2
10	Sulfuric acid, 3.6N[1]	C, 0.1%	88,320	40.6	22.4
11	Sulfuric acid, 3.6N	p.Toluidine, 0.05M; Formaldehyde, 1%	88,010	54.1	(increase 3.4)[2]
11	Sulfuric acid, 3.6N	p.Toluidine, 0.05M; Formaldehyde, 1%	88,010	54.1	(increase 3.4)[2]

[1] Specimens boiled in water for 10 min after pickling treatment.
[2] No statistically significant difference (in 0.05 level) between the ductility of this specimen and blank.

as A, B, and C. Letter D designates an inhibited water soluble pickling chemical.

In the discussion of results that follows, tensile strength is expressed as the greatest load per square inch of the actual, original cross-sectional area carried during tension test; ductility is expressed in percent reduction in area at the point of greatest reduction with reference to original cross-sectional area; and loss of ductility is expressed as percentage of differences between ductility of pickled and blank specimens, referred to the blank specimens at 100 pct ductile. In the tables, blanks precede the corresponding specimens for ready comparison of data.

With uninhibited sulfuric acid as the pickling bath, 61 to 69 pct of the ductility of SAE 1020 steel is lost, see table I and fig. 1 (Nos. 1 and 2 blanks, Nos. 3 and 4 pickled). It will be observed that, except for a small core in the center, the rod fracture indicates embrittlement throughout.

Boiling identically treated rods for a period of 10 min results in only 30 to 40 pct of the

TABLE II

Effect of pickling specimens of SAE 1020 steel, ½ in. diam and 12 in. long, in hydrochloric acid at 77°F for 90 min.

	SOLUTION	Inhibitor	Tensile Strength, Psi	Reduction of Area, Pct (Ductility)	Loss of Ductility, Pct
Fig. 3					
1	Blank	None	96,940	45.4	0
2	Blank	None	96,430	48.5	0
3	Hydrochloric acid, 4.8N	None	95,410	14.3	69.6
4	Hydrochloric acid, 4.8N	None	95,660	18.9	59.8
4a	Blank	None	85,080	54.1	0
4b	Blank	None	84,690	53.6	0
5	Hydrochloric acid, 4.8N[1]	None	83,670	54.1	(0)[2]
6	Hydrochloric acid, 4.8N[1]	None	84,310	53.1	(1.5)[2]
6a	Blank	None	93,590	43.6	0
6b	Blank	None	93,590	43.6	0
7	Hydrochloric acid, 4.8N	Formaldehyde, 1%	93,850	44.1	(0)[2]
8	Hydrochloric acid, 4.8N	Formaldehyde, 1%	83,850	41.0	(6.0)[2]
9	Hydrochloric acid, 4.8N	A, 1%	95,130	34.9	20.0[2]
10	Hydrochloric acid, 4.8N	A, 1%	96,410	34.4	21.1
10a	Blank	None	93,850	42.6	0
10b	Blank	None	94,360	40.0	0
11	Hydrochloric acid, 4.8N	B, 0.1%	95,130	30.3	26.6
12	Hydrochloric acid, 4.8N	B, 0.1%	93,080	33.3	19.4
Fig. 4					
10a	Blank	None	93,850	42.6	0
10b	Blank	None	94,360	40.0	0
11	Hydrochloric acid, 4.8N	Quinoline, 1%	93,370	20.4	50.6
12	Hydrochloric acid, 4.8N	Quinoline, 1%	92,909	21.9	47.0
Fig. 5					
10a	Blank	None	96,920	43.1	0
10b	Blank	None	97,690	44.6	0
11	Hydrochloric acid, 4.8N	B, 0.1% Quinoline, 1%	98,210	32.0	26.3
12	Hydrochloric acid, 4.8N	B, 0.1% Quinoline, 1%	97,190	29.1	32.9

[1] Specimens boiled in water for 10 min after pickling treatment.
[2] No statistically significant difference (in 0.05 level) between the ductility of this specimen and blank.

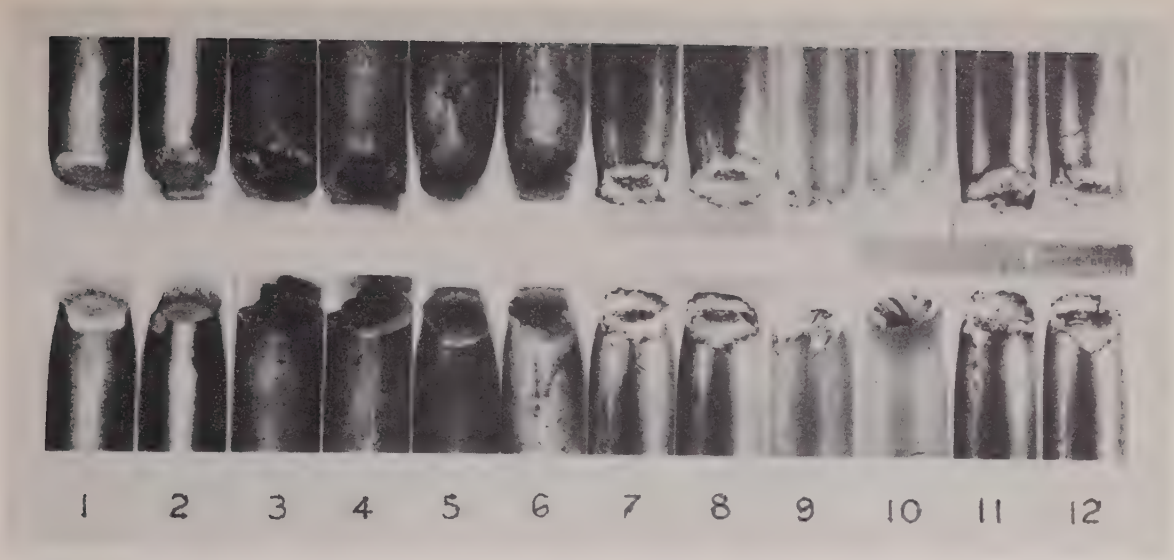


FIG. 3 - Effect of pickling specimens of SAE 1020 steel, ½ in. diam and 12 in. long, in uninhibited and inhibited hydrochloric acid at 77°F for 90 min. Specimens 5 and 6 have been boiled in water for 10 min subsequent to pickling.

ductility of SAE 1020 steel being lost, table I and fig. 1 (Nos. 5 and 6), restoring approximately 20 pct of the ductility. However, boiling does not improve the depth of embrittlement as seen from these photographs.

When 1 pct formaldehyde is added to the sulfuric acid pickling bath, 52 to 59 pct of the ductility of SAE 1020 steel is lost, see table I, fig. 1 (Nos. 8a, 8b, 9 and 10). The nature of the fracture is not essentially altered by the addition of formaldehyde; however, when identically treated rods are boiled in water for 10 min, the ductility is completely restored, table I and fig. 2 (Nos. 3 and 4). The use of formaldehyde in uninhibited sulfuric acid pickling bath makes possible removal of embrittlement by boiling, giving the typical conical break characteristic of ductile specimens.

The addition of 1 pct of quinoline to the sulfuric acid pickling bath produces results nearly identical to those obtained by formaldehyde, see table I, fig. 1 (Nos. 11 and 12); fig. 2 (Nos. 5 and 6).

With inhibited sulfuric acid as the pickling bath, using either commercial inhibitors C or A, see table I, fig. 1 (Nos. 7 and 8) 52 to 57 pct of the ductility of SAE 1020 steel is lost. It will be noticed that, just as in the case of uninhibited sulfuric acid, the fracture indicates embrittlement throughout the rod, except for a small core in the center.

Boiling identically treated rods for a period of 10 min results in only 20 to 26 pct loss in ductility. Depth of embrittlement is not improved, table I, fig. 2 (Nos. 7 and 8, 9 and 10).

A very special effect occurs when p. toluidine

FIG. 4 - Effect of pickling specimens of SAE 1020 steel, ½ in. diam and 12 in. long, in uninhibited and inhibited hydrochloric acid at 77°F for 90 min. Specimens 3,4,5 and 6 have been boiled in water for 10 min subsequent to pickling.

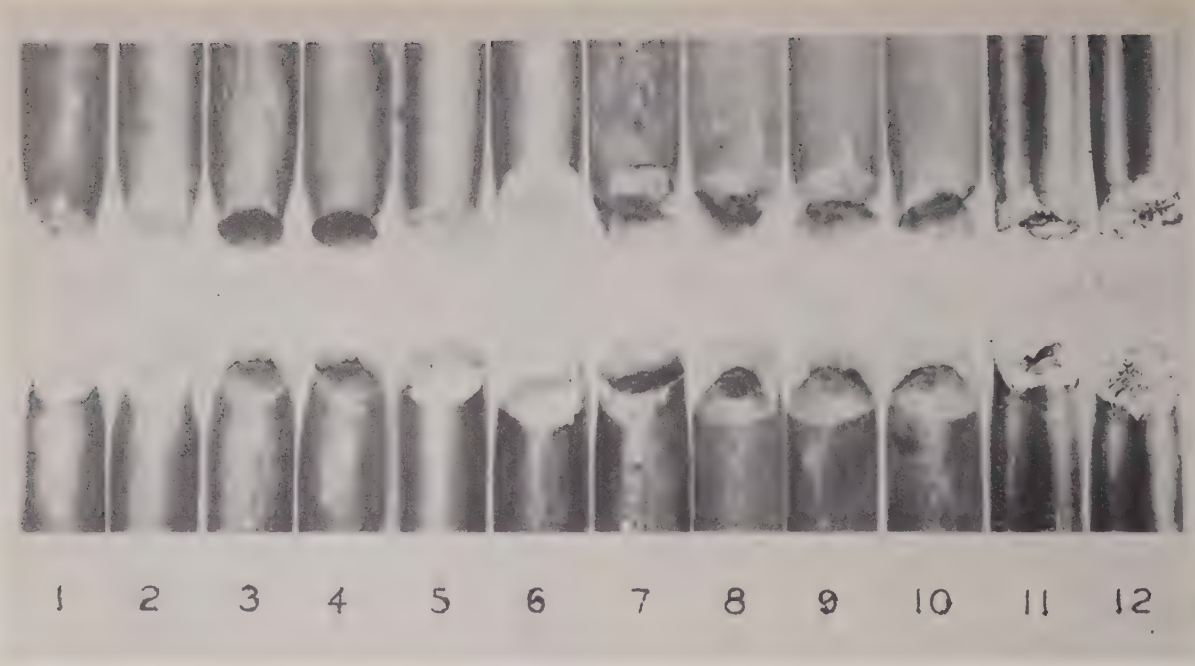


FIG. 5 - Effect of pickling specimens of SAE 1020 steel, ½ in. diam and 12 in. long, in hydrochloric acid at 77°F for 90 min.

0.05 Molar plus 1 pct formaldehyde is used as the inhibitor in the sulfuric acid bath. Embrittlement of SAE 1020 steel is completely avoided so that subsequent boiling is unnecessary, table I, fig. 2 (Nos. 11 and 12).

With uninhibited hydrochloric acid (4.8 N) at 77°F as the pickling bath, 60 to 70 pct of the ductility of SAE 1020 steel is lost, table II, fig. 3 (Nos. 1 and 2 blank, Nos. 3 and 4 pickled). This is not essentially different in amount from that obtained with uninhibited 3.6 N sulfuric acid at 175°F, table I, fig. 1 (Nos. 3 and 4). That the two are not identical is shown not only by the corresponding photographs, where it is seen that depth of embrittlement is much less than with the sulfuric acid, but also by the effect of subsequent treatment with boiling water.

Boiling identically treated rods of SAE 1020 steel for a period of 10 min results in complete removal of embrittlement, table I, fig. 3 (Nos. 5 and 6).

The effect of adding 1 pct formaldehyde to the hydrochloric acid pickling bath is seen in table I, fig. 3 (Nos. 7 and 8). It might appear that complete prevention of embrittlement has occurred. However, close inspection of the specimens reveals surface cracks not clearly seen in the photographs.

With inhibited hydrochloric acid as the pickling bath, using commercial inhibitors A or B, table II, fig. 3 (Nos. 9, 10, 11 and 12) on SAE 1020 steel, 19 to 27 pct of the ductility is lost. The fracture visually appears different from that of the inhibited sulfuric acid, table I, fig. 1 (Nos. 7 and 8).

Boiling identically treated rods of SAE 1020 steel for a period of 10 min results in complete restoration of ductility, fig. 4 (Nos. 3, 4, 5 and 6). This is not surprising, in view of the fact pointed out above that pickling SAE 1020 steel in the uninhibited 4.8 N hydrochloric acid gives no embrittlement if the pickled rod is subsequently boiled in water for 10 min.

With 1 pct quinoline plus 1 pct formaldehyde as the inhibitor in the 4.8 N hydrochloric acid pickling bath at 77°F, complete prevention of hydrogen embrittlement is obtained, fig. 4 (Nos. 7 and 8). A chemical reaction occurs. One of the products is thought to be the formaldehyde addition compound of dihydroquinoline. Reduction of strength of quinoline and formaldehyde from 1 pct each to 0.2 pct of each in 4.8 N hydro-

TABLE III

Effect of pickling specimens of SAE 1020 Steel, ½ in. diam and 12 in. long in water solution of commercial pickling chemical D for 90 min at 175°F.

	SOLUTION	Inhibitor	Tensile Strength, Psi	Reduction of Area, Pct (Ductility)	Loss of Ductility, Pct
1	Blank	None	89,410	55.1	0
2	Blank	None	88,520	53.6	0
3	D, prepared as recommended by manufacturer	None	89,740	37.8	30.5
4	D, prepared as recommended by manufacturer	None	88,903	35.7	34.4
4a	Blank	None	89,340	53.3	0
4b	Blank	None	87,180	51.3	0
5	D, prepared as recommended by manufacturer[1]	None	89,030	43.4	17.0
6	D, prepared as recommended by manufacturer[1]	None	86,480	41.3	21.0

[1] Followed by immersion in boiling water for 10 min.

chloric acid does not alter its effectiveness in prevention of hydrogen embrittlement, fig. 4 (Nos. 9 and 10). Quinoline alone added as an inhibitor to 4.8 N hydrochloric acid is seen to be quite ineffective, table II, fig. 4 (Nos. 11 and 12).

Another highly effective inhibitor of hydrogen embrittlement on SAE 1020 steel in the 4.8 N hydrochloric acid at 77°F is the 0.05 Molar p. toluidine plus 1 pct formaldehyde mix, fig. 5, (Nos. 3 and 4). The complexes obtained have been subjected to much study and well reviewed by Sprung[1]. This mix has been shown earlier in this paper to be effective in the sulfuric acid. However, in hydrochloric acid (4.8 N) at 77°F) this acts as an inhibitor of metal attack as well, which is not true in the case of the sulfuric acid.

[1] *M. M. Sprung, Chemical Reviews, vol. 26, 1940, p. 297.*

If formaldehyde in concentrations of 0.2 pct or 1 pct is added to 4.8 N hydrochloric acid inhibited with commercial inhibitor B, complete prevention of embrittlement of SAE 1020 steel is obtained, fig. 5 (Nos. 7, 8, 9 and 10). Adding 1 pct quinoline to 4.8 N hydrochloric acid pickling bath inhibited with commercial inhibitor B, on the other hand, offers no advantage; 23 to 33 pct loss in ductility of SAE 1020 steel occurs, table II, fig. 5 (Nos. 11 and 12).

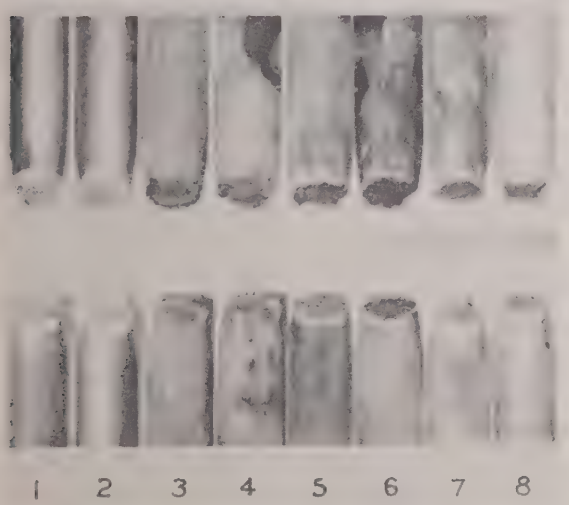


FIG. 6 - Effect of pickling specimens of SAE 1020 steel, ½ in. diam and 12 in. long in water solution of commercial pickling chemical D for 90 min at 175°F. Specimens 5,6,7 and 8 have been boiled in water for 10 min subsequent to pickling.

Pickling agent D used at 175°F, without additional acid, has about the same effect as the sulfuric acid studied, in that embrittlement occurs, table III, fig. 6 (Nos. 3 and 4 treated compared to 1 and 2 untreated); not removable by subsequently boiling the SAE 1020 steel rods in water, table III, fig. 6 (Nos. 5 and 6), but removable if 1 pct formaldehyde is added and the rod is subsequently boiled in water for 10 min, fig. 6 (Nos. 7 and 8).

The SAE 1095 steel was tested with 4.8 N hydrochloric acid as the pickling bath at 77°F, using some of the inhibitors found to be effective as a result of the work on SAE 1020 steel. It was found that addition of formaldehyde from 0.2 pct to 1 pct to commercial inhibitor B or quinoline-formaldehyde mixes containing 0.2 pct each to 1 pct each were completely effective in preventing embrittlement of this high carbon steel.

Large ductility found for this steel was due to the fact that the steel had been annealed.

The molybdenum silico nsteel contained 0.52 C, 0.82 Mn, 0.013 P, 0.018 S, 2.04 Si, 0.10 Cu, 0.17 Ni, 0.27 Cr and 0.33 Mo.

Studies were made with 4.8 N hydrochloric acid as the pickling bath, using the same inhibitors as in the case of the SAE 1095 steel. Prevention of embrittlement was obtained in all cases. All studies were confined to 77°F.

Summary

Pickling with 4.8 N hydrochloric acid alone at 77°F or with most of the inhibitors tested yields embrittlement. In all cases tested, subsequent boiling of SAE 1020 steel essentially removes all embrittlement from the pickled rods.

Pickling with 3.6 N sulfuric acid alone or with most inhibitors tested at 175°F yields embrittlement of SAE 1020 steel not completely removable by a subsequent 10-min boil in water.

Addition of formaldehyde to the 3.6 N sulfuric acid alone or with inhibitors tested at 175°F makes it possible to remove all observable embrittlement of SAE 1020 steel on subsequent boiling of the pickled specimens for 10 min.

Use of quinoline-formaldehyde or of p. toluidine-formaldehyde mixes in the 4.8 N hydrochloric acid pickle solutions at 77°F appears to prevent embrittlement, so that subsequent boiling of the work is unnecessary. A similar effect is obtained for p. toluidine-formaldehyde mixes in sulfuric acid at 175°F. However, metal attack inhibition is not obtained in the sulfuric acid.

Addition of formaldehyde to commercial inhibitor B tested in 4.8 N hydrochloric acid prevents embrittlement of the specimens at 77°F.

Tensile-fracture in the Universal Testing Machine offers a rapid and convenient means of recognizing embrittlement, if associated with observation of percentage reduction of area. The depth of penetration of the embrittlement can be recognized.

ACKNOWLEDGEMENT

The author wishes to acknowledge the assistance of Stanley M. Fugel, Robert E. Wagner, Charles C. Jackson, Jr. and Dr. Charles F. Pickett in making this article possible.

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CARBIDE DRILLS

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HIGH production rates in drilling are possible with carbide drills because they permit the use of heavier feeds; give long drill life between grinds; perform well on holes where a chip problem may develop if a twist drill is used; maintain accuracy; produce smooth holes with a minimum of runout; permit drilling larger holes from the solid instead of removing material by successive drilling operations; and will drill holes much closer to desired size.

Carbide tipped all-depth drills may be divided into two types: (1) the solid carbide type, shown in fig. 1, and (2) the wear strip types shown in figs. 2 and 3. Drills from ¼ to ⅝ in. diam are ordinarily made to the solid carbide design. In this type, the entire drill end is carbide, copper brazed to a steel shank or body.

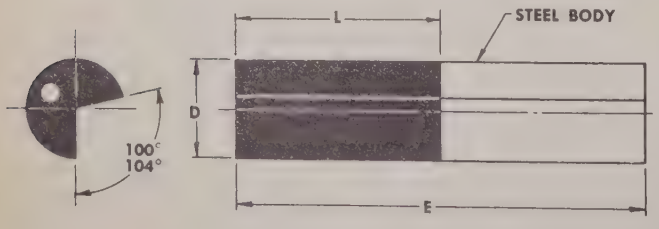
The wear-strip type of drill shown in figs. 2 and 3 is made with one carbide cutting tip and two carbide wear strips. One wear strip is located 90° behind the cutting edge and the other 183° behind the cutting edge.

The brazed-type wear strip drills shown in fig. 2 can be made from 0.290 to 1 in. diam, and the same size drill tubes can be used as are used for solid carbide type drills. Tips are attached with the same brazing method. This drill is easier to fabricate than the solid carbide drill since carbide blanks can be purchased and the complete drill end can be made in the tool room.

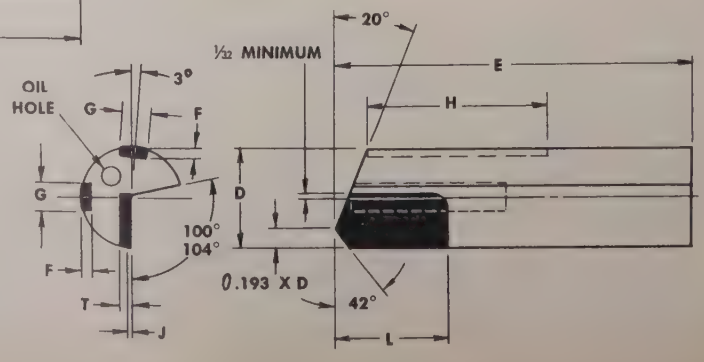
The wear-strip type drill shown in fig. 3 has the advantage of easier handling, particularly during sharpening, since the drill end is detachable. Drills of this type are made in diameters ranging from 1 to 3 in. In larger sizes, the solidly attached end type tend to become heavy and more cumbersome to handle. The shank-end of this drill, known as the wear-strip-detachable type, is an adaptation of Pratt & Whitney drill bars.

The OD of all carbide tipped all-depth drills are ground cylindrical with 0.0006 in. per in. included back taper. After the OD has been ground, a longitudinal clearance should be ground along the cutting tip, leaving a circular land below the cutting edge. This land, *J* in figs. 2 and 3, should vary in width from 0.030 in. for a 0.290 in. diam drill to 0.050 in. for a 3-in. drill. The face of the cup-type grinding wheel should just clear the periphery of the steel drill body in grinding this clearance. This land should never be touched when sharpening.

The OD of the steel bodies for all wear strip drills should be about 2 pct smaller than the drill size. The oil hole in the shank end of the wear strip detachable type drills is counterbored to a sufficient diameter and depth to receive the



ABOVE
FIG. 1 - Solid carbide type of all-depth drill.



RIGHT
FIG. 2 - Brazed type wear strip all-depth drill.

Three types of carbide drills now in use are discussed in this article. It deals also with drill design, sharpening techniques, machines on which they are used, cooling and lubrication, and cutting speeds and feeds.

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copper oil tube. For drill rigidity, and consequently heavier feeds, the drill bar should never be longer than is necessary for a given job.

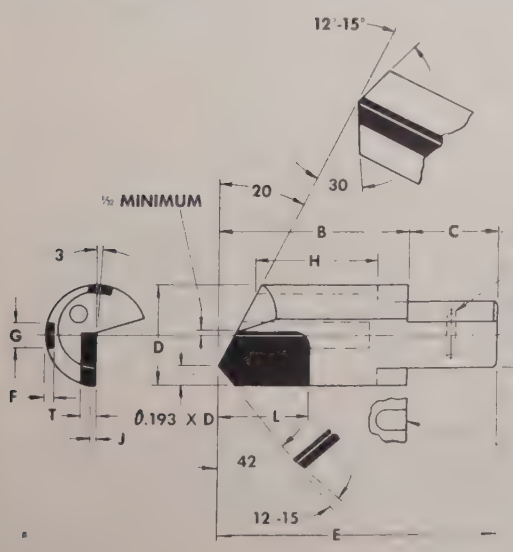
The cutting edge of carbide drills should be from 0.003 in. below center to on center—never above center—because this produces a freer cutting action. The cutting face side of the drill flute should be located in the drill end about 1/64 in. ahead of the corresponding side of the flute in the drill bar. This prevents the formation of a step to which chips might cling.

The successful operation of any all-depth carbide drill depends largely on the use and maintenance of correct cutting and relief angles. A drill ground to the specification shown in fig. 4 will be satisfactory for most drilling operations.

All grinding should be done free-hand, and the same type of grinder may be used as is used for carbide tipped single-point tools. When rough grinding the 42° outer cutting angle, the drill should be held firmly by hand in a V-block, which is swung at a 42° angle, and the grinder table tilted at 12° to 15° angle. During grinding, the drill should be rotated about its own axis, as when grinding any drill, to produce the 12° to 15° eccentric clearance angle.

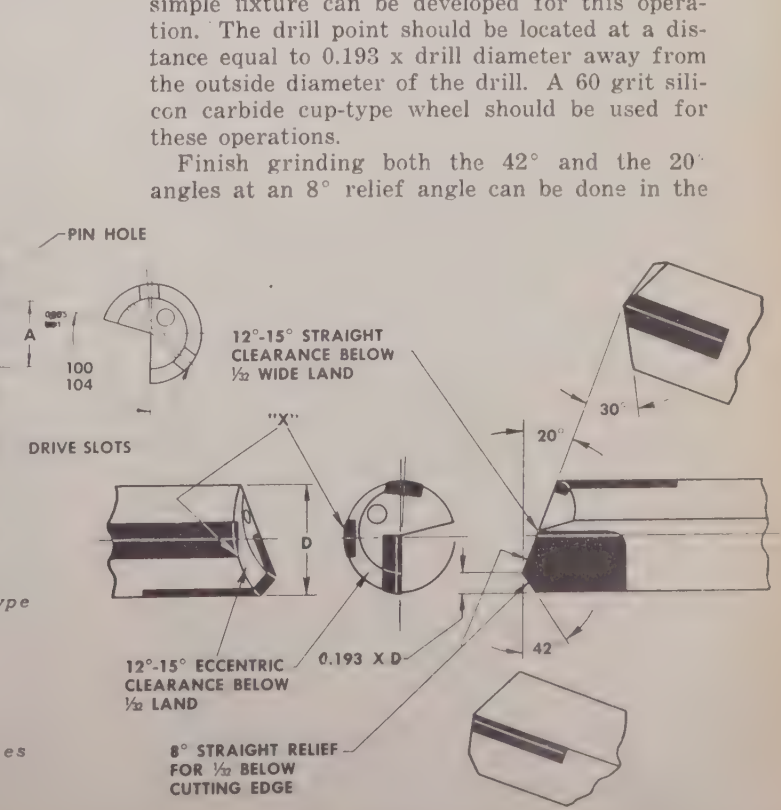
When rough grinding the 20° inner cutting angle, the drill should be held firmly by hand in a V-block which is swung at a 20° angle and the grinder table tilted at the 12° to 15° clearance angle. The cutting tip face surface should be kept parallel to the top of the grinder table. A simple fixture can be developed for this operation. The drill point should be located at a distance equal to 0.193 x drill diameter away from the outside diameter of the drill. A 60 grit silicon carbide cup-type wheel should be used for these operations.

Finish grinding both the 42° and the 20° angles at an 8° relief angle can be done in the



ABOVE

FIG. 3 - Wear-strip-detachable type of all-depth drill.



RIGHT

FIG. 4 - Cutting and relief angles for carbide all-depth drills.

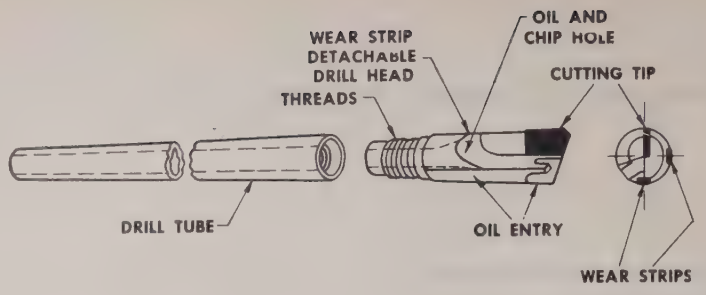


FIG. 5 - This special design of a short drill can be rotated instead of rotating the work. Cutting angles are comparable to those used in stationary drills, but chips are carried out through the center of the drill instead of through an external axis.

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same fixtures, but the table tilt is only 8°. The land below the cutting edge should be about 1/32 in. wide. To obtain a keen cutting edge, 100 to 150-grit diamond cup-type wheels are used for finish grinding. A light hand feed of about 6 ipm should be used for the final pass along the grinding wheel. Lapping on the cutting edge with a 220 or 240 grit diamond wheel improves operating conditions on some jobs.

The steel drill body above the cutting edge and behind the drill flute should be ground away at a 30° angle, as shown in fig. 4. This aids the flow of cutting fluid into the drill flute. A 46 grit aluminum oxide wheel is suitable for this grinding.

Sharpening should be done only on the end of the drill. The face of the cutting tip should never be touched, since this face is located on center to 0.003 in. below center when the drill is made and should not be altered.

Best results are obtained with carbide drills when used in standard gun drilling machines since these are designed for the use of stationary type drills. A pressure gage should be attached to the drill feeding slide to determine that the oil pressure is high enough to maintain a uniform rate of chip flow. The all-depth drill, because of its design, is self-grinding in the work. Its tendency, therefore, is to follow the direction in which it has been started. Drill guide bushings in the combination drill-guide-and-work-support are important in drill setup. For best results, the drill should be guided through the bushings and fed into the work while the work is rotating at the correct cutting speed.

Chip removal is the most important function served by the cutting fluid. The fluid is forced under pressure through the entire length of the drill into the annular-shaped groove produced by the drill and out through the V-shaped flutes. This washes the chips through the flute to the open end of the hole and into the chip duct. Oil pressures for various carbide drilling jobs vary between 300 and 800 psi, depending upon the drill size, depth of drilled hole and feed rate. Both soluble oils and cuttings oils have been used, but cutting oils seem to develop a smooth, springy type chip which has a minimum tendency to pack in the drill flute. They also leave a keen cutting edge.

In drilling steel, work should be rotated at a speed that will give a cutting speed at the outside diameter of the drill ranging from 130 to 350 sfpm. A new job should be started at from 200 to 250 sfpm and the speed varied in either direction until a satisfactory balance between drill life and the feed rate is obtained. Most gun drilling type machines are designed to cover only the lower end of this speed range—the range used for high speed steel drills. This means that top speeds of the machines cover only the lower portion of the possible carbide speed range. Consequently, full advantage of carbide drills is not usually obtained because cutting speeds are below the most economical range.

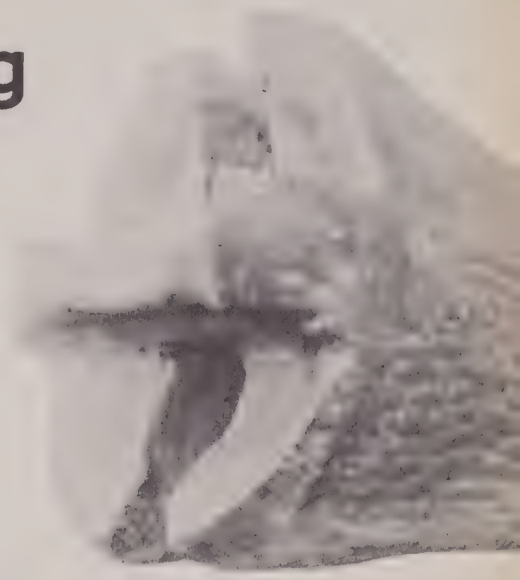
Gun drill work to date has been done mainly with feeds within the range of 0.006 and 0.0036 in. per revolution, the lighter feeds for smaller drills and the heavier feeds for larger sizes. Feed rates depend upon oil pressure used and the size of oil holes through the drill. Oil flow must be sufficient so there is no tendency for chips to pack in the drill flute. Wear strips last longer if small oil grooves are milled ahead of each wear strip, the rear end of each groove being connected to the main oil hole. It has also been found that, as feed rate is increased there is an increased tendency for the drill to deviate from its true course.

Long drills, generally, should not be rotated because the unsymmetrical shape and the relatively small cross-section tend to set up an unbalanced condition that may result in chatter and breakdown of the cutting edge. This is pronounced at higher speeds of carbide drills. If drills such as shown in fig. 5 are used, it may be feasible to rotate the drill. Cutting angles on this type are comparable to those used in stationary drills, but the chips are carried out through the center of the drill rather than through an external flute.

A steady rest should be placed about midway between the drill feed slide and the combination drill guide and work support carriage. To eliminate "singing" in a drill, the result of high frequency vibration or chatter, triangular-shaped wooden wedges can be driven into the guide pushings. Current indications are that when all-depth drills approach a diameter of 2.5 in., it is necessary to break the broad chip which comes from both the 20° and 42° cutting angles. This can be done by grinding steps in the cutting edges. A slight change in the relationship between the 42° outer cutting angle and the 20° inner cutting angle may also aid in breaking up the chips flowing from the drill.

Some Considerations in Hard Surfacing

Born of a need for better oil well drilling tools, hard surfacing of wear points in industrial equipment has become a widescale practice. Some considerations affecting the economics of hard surfacing are discussed in this article.



Originating in the oil fields, hard surfacing has made possible increased well drilling speeds and permitted drilling in exceedingly abrasive formations. This is a churn bit after hard surfacing but before it is dressed.

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HARD surfacing, or the protection of metal parts by welding over them an alloy specifically designed to resist abrasion, originated in the oil fields. The need was not only to prolong the life of the drilling bit, but was an effort to increase drilling speed, and in some cases render possible the penetration of certain formations.

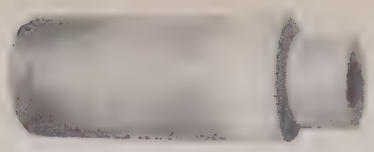
The increase in performance of a hard surfaced part is often overlooked when the merits of the operation are being considered. It can be practically more important than saving the part itself.

Another result of hard surfacing often not considered is the subsequent saving in time and labor of replacing worn parts. This is entirely apart from the cost of the part itself, and in many instances may be equal to or even greater than the part cost. Not only are savings effected on the cost of making the replacement, but also down-time on the machine is greatly reduced.

As a consequence, hard surfacing is becoming a part of the standard operating procedure in many industries. It received considerable impetus during the war. When new parts could not be had, the War Production Board issued AAI priorities to manufacturers of hard surfacing rods so that both military and civilian equipment could be kept operating at high efficiency. Consequently, a number of manufacturers are considering hard facing wear points in new equipment before it is shipped.

There are often questions of technique involved in hard surfacing and to get the best results from a hard surfacing operation, it is sometimes necessary to plan the operation. One such instance is the facing of tractor rollers. If an attempt is made to rotate the roller manually during the welding operation, a very rough surface, requiring subsequent grinding, is obtained. Also, if the facing is done without any consideration of heat effects, the flange on the roller is apt to become softened and may later bend under the rough service to which a tractor is usually subjected.

To overcome these troubles, it has now become



Another oil industry hard surfacing application is this tool joint. Only the point of major wear is guarded by the band of hard surfacing alloy.

standard practice to hold the roller in a motor-operated fixture which turns it at a speed equal to, or very slightly in excess, of the speed with which it is being faced. Motion is maintained by the welder resting his foot on a peddle and should the rotation begin to get ahead of him he simply raises his foot momentarily.

Meanwhile, approximately two-thirds of the roller is kept immersed in cold water and thus all harm to the bushing, as well as any softening of the flanges, is avoided. This device, while simple, often is the difference between success and failure and determines the speed, efficiency, and ease with which these rollers are hard surfaced.

In the selection of a proper material to do the job, whether it be by the actual user of the part or the manufacturer, there are several factors to be considered. There are usually but two figures with which to work, the Rockwell or Brinell hardness of the deposit and the price per pound of the rod.

Various instrument makers, as well as the Bureau of Standards, have attempted, without success, to devise a machine for estimating the wear resisting qualities of a given surface. There appear to be involved unknown factors, or at least factors not readily recreated in all exactitude in the laboratory.

To illustrate the complexity of this problem with a quite unusual case, the Bureau of Standards ran a test wherein two sets of weighed, and different composition, steel balls were used to grind a fixed weight of a certain material to a definite mesh. The loss in weight of each set was supposed to represent their relative wearing qualities. When the test was repeated, using a different substance to be ground, the losses incurred indicated an exact reverse of the wear resistance found in the first run.

As a result of this and many other experiments, the conclusion has been reached that only by making an actual test, under exact field conditions, can the relative worth of various wearing surfaces be estimated.

As a rule the user on the job is in the best position to do this. Consequently, it is being more widely recognized that the Rockwell or Brinell hardness of the surface is only one of several properties going to make up the wear resistance. On many jobs it has been found that rods giving considerably softer deposits equal or exceed in wear much harder surfaces.

The manufacturer's engineer has not, as a rule, had the benefit of this type of experience, and is still much inclined to regard wearing qualities as more or less a straight line function of hardness. However, these men are learning that while hardness may give an excellent indication of wearing characteristics, other properties must also be present to assure this indication as accurate. A lack of understanding of this fact is well illustrated by the experience of one large company.

The extent to which dredging cutters wear is shown. At right is a dredge cutter hard surfaced to minimize the wear shown in the cutter at left.

The chief engineer insisted that the faced surface proposed have exceedingly high Rockwell hardness. At the same time a stress relieving operation was specified, following the facing job. The stress relief had to be conducted at such

This tractor roller demonstrates the uniformity with which hard surfacing can be done.

a high temperature as to be practically a normalizing treatment. When it was found that a face deposit recommended was appreciably softened by this heat treatment, the most excellent field results were ignored, and a high air-hardening steel which gave the required Rockwell was employed. This steel was not intended for hard facing, and, as a result, the company turned out a number of such inferior parts that they have become thoroughly discouraged about the whole idea.

This case raises the point that the failure of one material to do a job should certainly not condemn hard surfacing. For every time unsatisfactory results from hard surfaces were obtained, it should be remembered that there are thousands of applications that are highly satisfactory.

The second figure which the prospective user of hard rods must consider is the price per pound. Too often the length of service given by a hard surfacing rod is regarded to be in direct ratio to its cost per pound. In other words, a rod costing twice as much or three times as much as another rod is assumed to give two or three times as much service; and if it does not do this it is felt that the cheaper rod is the more economical. The serious fallacy is that the price paid for the rod does not represent the cost of getting it into useful service. To the purchase price must be added the per pound application cost, which is usually as high, or higher, than the per pound application cost, which is usually as high, or higher, than the per pound material cost. For two rods having equal application costs the real ratio of performance is expressed by the purchase plus application cost of each.

To illustrate, assume the cost of one material is 20¢ per lb and another is 50¢ per lb, and assume the application cost is equal at 75¢ per lb. Then the true cost of the first one is 95¢ per lb and the second one $1.25 per lb. Consequently, instead of the second one having to wear two and a half times as long, it would be distinctly economical to use it if it wore one and a half times as long.

Finally, there is a most definite difference in application costs themselves and when these are carefully determined the initial price per pound is found to be only one factor in the cost of this work. It was with the specific idea of lowering application costs that the metallic coated hard surfacing rod was developed. Their higher yield of deposit per pound of rod applied means both a saving in rod recovered and a greater speed of application itself.

Thus it appears that it is more advantageous in most instances to use a better type rod even though its relative wear is not in full proportion to its cost.

Effects of Hydrogen in the Corrosion of Steel

EMBRITTLEMENT and blister defects in steel tanks, pipes and other pressure vessels due to hydrogen generated in corrosion reactions were discussed in a paper by M. H. Bartz and C. E. Rawlins of the Phillips Petroleum Co., Bartlesville, Okla., given before the annual conference of the National Association of Corrosion Engineers.

The problem has become increasingly serious in the petroleum industry, according to the report, where more sour or high sulfur crudes, gases, gasoline, and hydrocarbons are being handled than ever before. Hydrogen has been the cause of the blistering and hydrogen sulfide, which reacts with the metal to liberate free hydrogen, has been established as the source of the trouble.

Present estimates place industry wide refinery equipment losses due to all types of corrosion at about 1¢ per gal of gasoline produced, and as the use of West Texas crudes increases, the problem is expected to become even more critical.

The paper states that this type of corrosion starts long before there is any loss of metal or weight and that the hydrogen released by the hydrogen sulfide-iron reaction is responsible for the embrittlement of hardened steel parts and the blistering of unhardened parts. Blisters of less than ⅛ in. diam to as large as 12 x 24 in. have been reported and the defects have been found to appear both on the interior and exterior surfaces of the pipes, tanks and vessels. No blisters have been found in equipment handling sweet crudes or gas, products which do not contain hydrogen sulfide, and only one case of blisters in line pipe has been uncovered. The equipment examined for this corrosive action has been operated only at normal outdoor temperatures.

This type of corrosion in the case of one vessel cut up and tested showed that the loop stress in shell fibers calculated from the bursting pressure was equivalent to a metal loss of 22 pct of the steel thickness. Yet, the shell had not diminished in thickness nor did it show any outward signs of corrosion other than the blistered surface. The composition of the gas contained in blisters was reported. Samples taken from one defect in the wall of a sphere operating at 135 psi on sour natural gas service showed: H_2, 99.5 ± 0.5 vol pct; CO_2, 0.5 ± 0.02 vol pct; CO, 0.05 ± 0.02 vol pct; air, 0.03 ± 0.10 vol pct; and water vapor, trace.

The pressure inside this particular blister was found to be 140 psi. Five other blisters in refinery vessels were tapped and the pressures were found to be 1000, 1700, 1700, 2500 and 2500 psi. Blisters ranged in size from 3 x 4 in. to 4 x 6 in. for these vessels and occurred 1 in. under the surface of a 1⅝ in. thick plate. The maximum pressure the vessels had been subjected to in service was 270 psi, and to 405 psi when initially tested prior to installation.

Cracks are not found in blister free material, according to the paper, and recognition of this has led to an attempt to correlate the two defects. Some evidence indicates that atomic hydrogen causes steel to crack while molecular hydrogen is apparently responsible for blister formation.

Agents known as promoters have been found to increase the amount of hydrogen which will penetrate steel during acid pickling and the effects of these elements—sulfur, arsenic, sele-

nium, tellurium, antimony and phosphorous—in promoting blisters is being investigated. It appears that any reaction releasing atomic hydrogen at the metal surface can cause blisters and, in particular, high temperatures, moisture or the release of nascent hydrogen by corrosion, pickling or electrolysis are considered the primary causes of blister formation. Oxygen or water must be present in order for hydrogen sulfide corrosion to take place and the reaction is accelerated in proportion to the amounts of water and oxygen present.

In discussing the mechanism by which the defect is produced, the report suggests that hydrogen atoms penetrate the metal and, having entered, form molecular hydrogen to exert a pressure stronger than the yield strength of the metal at that particular point. Inclusions, laminations, heavily segregated phosphorous areas, or minute voids permit enough pressure to accumulate to cause the metal to swell, puff or otherwise blister. Occluded hydrogen may also be present as a result of steelmaking practice, pickling or other causes, and this hydrogen either with or without additional gas generated by corrosion can cause blister defects.

A change in steel specifications has been suggested by Phillips engineers as a possible aid in combatting the corrosion problem. Specifications for steel to be used in handling sour materials should, according to the report, call for the cleanest commercial steel as free as possible from lamination. If fully killed types are specified, comparatively homogeneous steels such as ASTM 201 or A212 should be obtained rather than semikilled or rimmed steels such as ASTM standard A285 (A70—A90), A283 (A10—A78) or A30. Specifying firebox quality rather than flange quality is also suggested to help decrease the degree of lamination and prevent some types of blistering.

Aluminum Used for 15-Ton Bridge Crane

FIG. 1 - All aluminum crane bridge, with an overall length of 97 ft, weighs 55 pct as much as a steel unit of comparable strength and capacity.

FIG. 2 - To conserve headroom, trolley rails have been attached to inside faces of the girders so that trolley does not extend above the top surface of the framework.

ALUMINUM alloys have been used in the structural members of a lattice girder type bridge crane to produce a unit weighing 55 pct as much as a standard structural steel unit of the same lifting capacity, 15 tons. As a result, the crane is said to be able to use a motor of 30 pct less hp than a standard steel unit and a reduction in the weight of the steelwork supporting the bridge was found possible.

The crane has been built for the rod mill of the Aluminum Co. of Canada at Arvida, Quebec, by the Dominion Bridge Co., Ltd., Lachine, Quebec.

Weight of the crane in standard steel design would have been about 94,000 lb, according to Dominion engineers, and, in comparison, the weight of the completed aluminum unit, shown in fig. 1, totalled 51,735 lb. The main girders, 97 ft long, were formed entirely from high strength aluminum alloys extruded by standard techniques into the desired channels and angles or rolled into plates. Rivets and bolts used in fabrication were also of special alloyed aluminum.

Some deviations from standard steel unit design were incorporated by the bridge engineers. To prevent excessive deflection of the horizontal girders, depth of the pieces was increased, and to conserve headroom the trolley rails were brought to the inside faces of the girders, as shown in fig. 2, so that the trolley would not extend above the top surfaces of the framework.

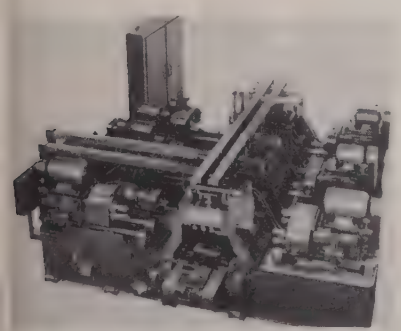
Considerable research was said to have preceded work on the crane bridge, especially in the development of riveting techniques for the special alloyed aluminum rivets.

New Production Ideas . . .

A cylinder block transfer machine, a foundry sand conditioner, a small core oven, a superficial hardness tester, and a thermocouple for gas turbines are discussed this week. Small tools and accessories include milling cutters with triangular carbide inserts, a magnetic welding positioner, drying and polishing sawdust, and a carboy acid pump.

Cylinder Block Drilling

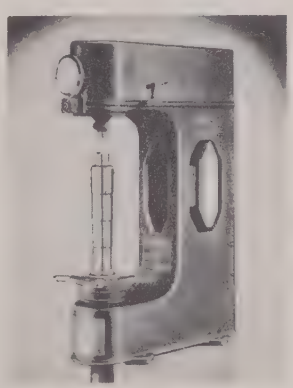
CORE-DRILLING, drilling, boring, counter-boring, spot facing, chamfering and semifinish boring operations on cylinder blocks are performed automatically on a special machine designed by *Snyder Tool & Engineering Co.*, Detroit. The cylinder block is moved from the conveyer to the first transfer plate which acts as a turn table. Automatic work cycle moves the positioned part to the first work station. The transfer mechanism is hydraulically actuated and transfers eight cylinder blocks simultaneously, each block being moved progressively from station to station until delivered at the end of the machine with all operations completed. Blocks are hydraulically raised and clamped at various work



stations. Multiple spindle tool heads are mounted on hydraulically actuated units provided with conventional rapid advance, feed and rapid return machining cycle.

Superficial Hardness Tester

ROCKWELL testing of surfaces that must not be marred, even by the standard Rockwell indentation, can be accomplished with a superficial hardness tester designed by *Clark Instrument, Inc.*, 10200 Ford Rd., Dearborn, Mich. Depth of penetration with the tester is held to limits of 0.005 in. or less. The new unit is suitable for test-



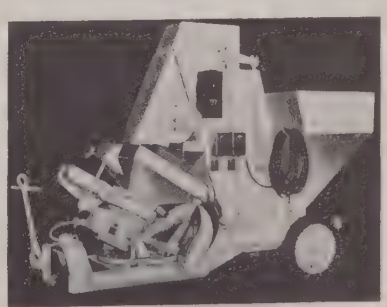
ing surface hardened steel, thin metals, rolled sheet metal, or very small areas. It is available in three models, with 8, 12, or 16 in. vertical capacity. Standard equipment furnished with each tester includes specially formed and lapped diamond cone penetrator, 1/16-in. steel ball penetrator, telescoping cover and oil reservoir for elevating screw, standard, checking, and V-anvils, and test blocks.

Wheel Dresser

DRESSING large diameter and broad faced grinding wheels which require the use of a large single point diamond dresser or a high priced cluster tool can now be done at from 1/10 to 1/3 the cost of these tools, according to *Diamonds & Tools, Inc.*, 19345 John R St., Detroit 3, by the C-7X dresser, also known as the Mighty Mite. This tool contains seven diamonds with a total diamond weight of between 1-1/3 and 1½ carats. The shank diameter is 7/16 in. and diamonds are set in Colmonoy metal. The tool is designed for dressing wheels on centerless grinders, large OD grinders and surface grinders.

Sand Preparation Unit

MAGNETIC separation, screening, and aeration of molding sand is possible with Nite-Gang, a portable sand preparation unit for the small foundry, announced by *Beardsley & Piper, Div. of Pettibone Mulliken Corp.*, 2424 N. Cicero Ave., Chicago 39. The machine may be pulled or pushed to any floor in the foundry, plugged into a convenient receptacle, the hopper loaded with up to ¾ cu yd of shakeout sand, and operation started by push button. The bucket elevator elevates the sand and discharges it over the magnetic separator which removes the iron. The



sand drops into a Screenarator unit, where it is screened, aerated, and discharged at a rate of 20 tons per hr anywhere within a radius of 25 ft and 160°. It will discharge into a heap, windrow, or container. The Screenarator unit swings to either side of the machine.

Small Foundry Oven

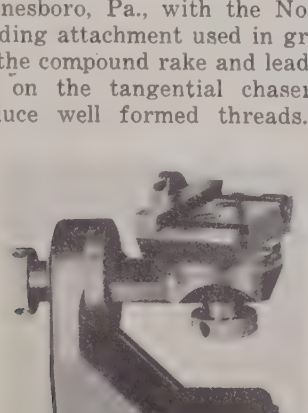
A NEW oven is available for production core baking in small foundries and for auxiliary

equipment in large operations. It has forced convection heating, recirculation, and forced exhaust. Automatic safety and temperature controls are provided on this gas-fired unit, which can be pre-set for any temperature up to 450°F. For small cores quick bakes of an hour

or less can be accomplished, and large cores, rush jobs, drying and pasting work can be accommodated. The small model has 2 to 6 shelves in two openings, each measuring 24x36x30 in. A large model consists of two complete small models engineered into one cabinet with partition. The oven has been designed by *Despatch Oven Co.*, 619 S.E. 8th St., Minneapolis.

Grinding Attachment

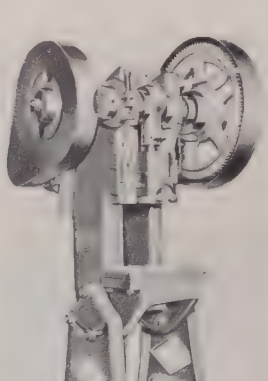
AN inexpensive method of grinding Landis chasers is announced by *Landis Machine Co.*, Waynesboro, Pa., with the No. 15 grinding attachment used in grinding the compound rake and lead angles on the tangential chaser to produce well formed threads. A



crossarm is supported by the base casting which is arranged so that the chaser platen can be adjusted vertically, making possible the grinding of any rake angle. The platen can be rotated throughout a 360° circle horizontally to produce the desired lead angle. The fixture is held in position by knurled knobs with pin holes for added leverage. The attachment can be used on any grinding machine which has a traversing table. It is recommended for use on all Landis chasers up to 1¼ in. wide.

Small Geared Punch Press

ONE of the smallest back geared punch presses manufactured is a 14-ton open-back inclinable



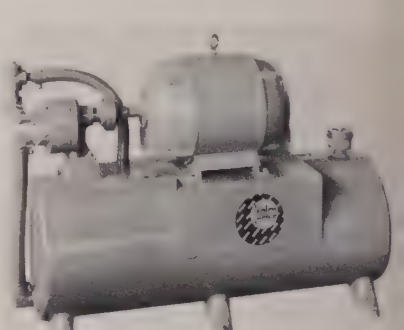
geared press announced by *Diamond Machine Tool Co.*, 3429 E. Olympic Blvd., Los Angeles 23. Specifications are: 65 strokes per min; 2-in standard length of stroke; 8x5-in. bed area; shut die height on No. 14-A, 7 in. and on No. 14-B, 9 in. These presses have a non-repeat single trip mechanism.

Vibration Mounts

A HEAVY duty mounting, with load capacities up to 7500 lb per mount, is designed to control shock, isolate high frequency vibration, and reduce noise transmittance to the floor. *Lord Mfg. Co.*, Erie, Pa., the manufacturer, claims that this mount reduces the need for massive foundations to achieve inertia and permits the placing of heavy machines where it would otherwise be impractical. Known as Shockmount, the unit is made of 3/16-in. steel, and is 1-3/16 in. high. The top plate contour limits movement and sheds oil and dirt. The flexing element is oil-resistant synthetic rubber. Another mount, the Chan-L-Mount, is a packaged vibration control, 1½ in. high, installed by sliding under the machine to be mounted. A heavy cushion of soft rubber prevents metal-to-metal bottoming, under occasional shock. It is made in a full range of sizes for small and medium weight machines.

Hydraulic Power Units

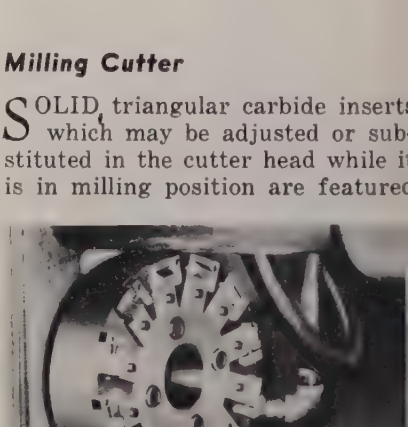
PACKAGED hydraulic power units, known as the Cubline, designed by *Hydraulic Press Mfg.*



Co., Mount Gilead, Ohio, open broad fields for the application of hydraulics where forming, bending, straightening, pressing, lifting, pulling and lowering are operating factors. Three capacities, 6, 10, and 15 gpm are available, with dimensions 46x18¼x32 in. for the first two units, and 48x20½x34 in. for the third. Each power unit consists of a 35-gal round oil storage reservoir with foot mountings; electric motor; 1000 psi gear pump; relief valve; coupling; pipe and fittings; and suction hose and clamps.

Milling Cutter

SOLID triangular carbide inserts which may be adjusted or substituted in the cutter head while it is in milling position are featured

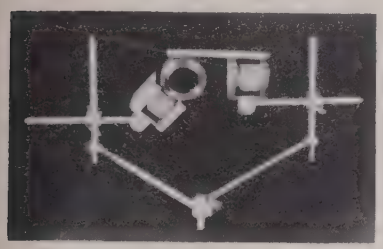


on a new milling cutter. When a blade becomes dull on this cutter manufactured by *Diamond-Detroit Inc.*, General Motors Bldg., Detroit 2, it is turned to the next triangular cutting edge and after the three cutting edges on one end of the tool have been used, the tool

may be reversed to the other end, presenting three additional cutting edges. Worn or dull tools can be resharpened by squaring the ends on an off hand grinder.

Welding Positioner

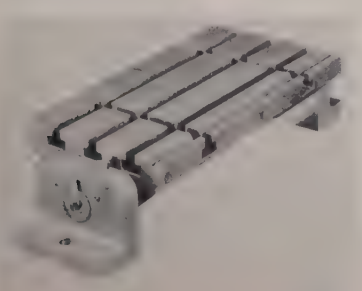
WHEN welding small parts or pieces, the use of a new welding positioner consisting of a sim-



ple, sturdy V-frame equipped with two powerful, permanent Alnico magnets, is said to save time and trouble. The device grips and holds work in virtually any position, ready for welding, soldering or other joining operation. Magnets are 2x2x2⅛ in. with equal holding power on all four sides. They are mounted universally on the frame which has two horizontal arms, 10 in. long, and two vertical arms, 6-in. long. The frame has a spread of 18 in. Distance between the arms and height on the vertical arms are readily varied. This Minute Man magnetic welding positioner may be obtained from *du Mont Corp.*, Greenfield, Mass.

Universal Work Table

A MILLING machine becomes a more flexible tool through the use of a universal work table, which tilts the work from 0 to 45° in either direction and locks it at



the desired angle. The table, manufactured by *Malnar Machine & Tool Co., Inc.*, 19301 St. Clair Ave., Cleveland 10, is 16⅞x9⅛ in. Calibrations on a dial at the end of the table simplify change of position of the work, without removing it from the table.

Acid Core Solder

A HEAVY, cream-like flux which is said to remain non-fluid and which will not run out at normal temperatures is used in Divco acid core solder according to an announcement by *Division Lead Co.*, Dept. 106, 836 W. Kinzie St., Chicago 22. This flux is said to work well on all solderable metals, including stainless steel, Inconel, nickel, and other hard to solder metals. Divco flux does not absorb moisture and when heat is applied it flows freely with quick spread and penetration, producing effective fluxing action. It is furnished in standard spool sizes of popular grades.

Metallic Filler

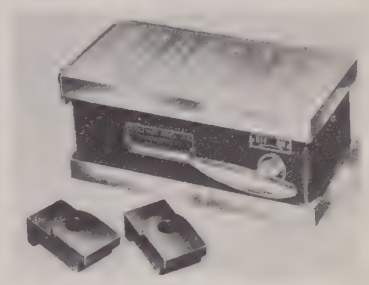
A METALLIC material of putty-like consistency, making possible its application by a knife or fingers, and which subsequently solidifies, has been marketed under the name of Railmetal. The material is a metal that is processed into a plastic compound containing an acid fluxing agent that etches its way into the metal surface in a manner similar to hot solder. It may be obtained from *Rocket Distributors, Inc.*, 209-14 41st St., Bayside, N. Y. The bonding agent is reported to have a tensile strength of 9000 psi. The filler metal, which hardens rapidly and may be wet or dry sanded or filed within a short time, requires no heat or flame in application. It resists water, oil, grease, gasoline and alcohol. The manufacturer claims it will expand and contract with the metal, eliminating damage resulting from temperature changes and sudden impacts. When applied in a thin coating, it is flexible and may be sprayed when thinned with Railmetal solvent. A thin coating functions as a waterproofer and a rust inhibiter.

Industrial Wheels

WATER-TIGHT industrial wheels with Timken tapered roller bearings are being made of aluminum, by *Aerol Co.*, 1823 E. Washington Blvd., Los Angeles 21. No bearing adjustment, lubrication or other servicing is necessary during the normal life of the wheel. A positive seal is accomplished by a combination of threaded retainer caps, Neoprene O-rings, and retainer spacers. A tough, all-purpose solid rubber tire is molded onto the wheel core. This rubber is oil and brine resistant and does not mark floors. The wheels are available in sizes, 6, 8, 10, 14 and 20 in. for either inside or outside mountings.

Permanent Magnet Chucks

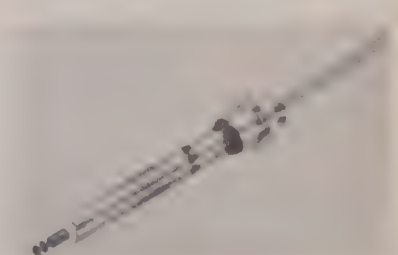
FOR use on small surface grinding machines, bench grinders, and for bench work, a permanent



magnet chuck with a 4x8-in. working surface has been announced by *Browne & Sharpe Mfg. Co.*, Providence 1. It is portable, has no wires or auxiliary generators, does not heat, and holds work well. The on and off positions of the handle secure and release work instantaneously, and the permanent magnets retain their energy indefinitely. The chuck is suited for both wet and dry grinding. Two removable stop plates for the back and left-hand end may be adjusted vertically to suit the work. A circular magnet chuck holds work from 1 3/16 to 7 in. diam, the strength of holding controlled by amount the handle is turned. The back of the chuck is recessed for attaching adapters for use on grinding machines.

Thermocouple

A HIGH rate of response is claimed for the thermocouple for gas turbines announced by



Manning, Maxwell & Moore, Inc., Bridgeport 2, Conn. The sensitive portion of the thermocouple consists of chromel tubing into which is inserted and welded an alumel wire. Time constants of better than 1.2 sec are measured at gas velocities of 250 fps, with a life

expectancy of 200 hr at 1600°F. Inconel sheath, lead wire protected by stainless steel braid and chromel alumel AN terminals are standard with all thermocouples.

Carboy Acid Pump

FASTER, safer, and more convenient removal of acids, alcohols, bleaches and other liquids from carboys is claimed possible with an electric carboy acid pump, announced by *Belke Mfg. Co.*, 947 N. Cicero Ave., Chicago 51. As the pump is slipped into the carboy the self-sealing rubber connection seals the carboy neck. Turning on the motor switch causes the compressor to build up air pressure in the carboy, forcing a steady flow of acid out through the pipe. The flow of acid can be stopped instantly by pressing the flow-stop lever which

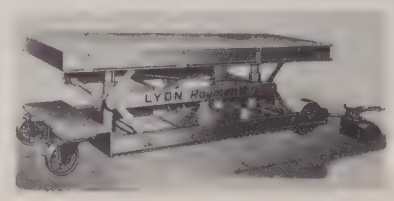
releases the air pressure in the carboy. A pressure release valve prevents the air pressure from going over 30 lb. The pipe, of lead, hard rubber, or Saran, is replaceable. Pumps are furnished with a 110 v, 60 cycle, ac motor, used with any standard electric outlet.

Drying and Polishing Sawdust

CUBE-CUT sawdust for drying and polishing metals and other materials has been developed by *Michael Wood Products, Inc.*, 625 Midland Ave., Dept. MF, Garfield, N. J. Known as Kube-Kut, this wood flour is made from green maple sawdust at logging operations, screened to insure uniformity in particle size and elimination of bark, dried in a uniformly heated rotary dryer, and again screened to eliminate fines. Absence of elongated slivers makes the material easy to shake free from products treated with it. Kube-Kut does not pulverize readily in tumbling processes, creating no films on the surface of the materials dried and polished, it is claimed. Kube-Kut sawdust is available in a variety of meshes and is packed in 50-lb bags.

Sheet Feeding Table

A NEW design of their standard 10,000 lb capacity double cylinder portable hydraulic sheet feeding table, has been announced



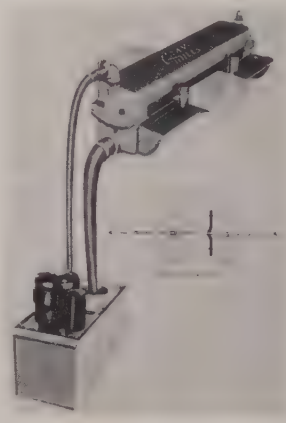
by *Lyon-Ramond Corp.*, 5554 Madison St., Greene, N. Y. Two vertical hydraulic cylinders which are synchronized by a toggle lever arrangement are incorporated in this design. Faster and more constant elevating speed and easier operation are claimed. The table top remains level at all times and additional lateral support has been provided for wide platforms. Specifications include the following: Capacity 10,000 lb; platform, 36 x 96 in.; lowered height 22 in.; elevated height 34 in.; elevation 12 in. Optional extras include extensions which will provide platform widths to 60 in. and lengths to 144 in. The table may also be equipped with either a two-speed hand pump or a ¾ hp motor-driven pump, operated by push button or pedal type switches.

Geiger Tubes

BETA - GAMMA end - window tubes, developed by *Tracerlab*, 55 Oliver St., Boston 10, are sensitive, rugged G-M tubes having mica windows and designed for high efficiency detection of low energy emitters such as carbon-14 and sulfur-35. They are self-quenching, filled with an inert gas and an organic quenching vapor, which give a minimum coincidence loss under usual operating conditions. This type TGC counters under normal conditions have a useful life in excess of 10^8 counts, and flashover point of 1800-2000 v. Tube characteristics are not affected within the temperature range of —5 to +55°C (+23° to +131°F). Tubes possess a low degree of photosensitivity. They are mounted on standard four-prong glazed ceramic tube bases.

Stock Oiling Unit

AN automatic pressure feed stock oiling unit for punch presses, announced by *Graymills Corp.*, Evanston, Ill., consists of a compact force-feed lubricator and a portable pumping unit. Used on roll-feed or strip-feed applications the unit is said to increase die life, keep stock cleaner, eliminate the use of drip cans and hand oiling methods, and permit the use of lubricant viscosities not practical with gravity feed oilers. The lubricant is pumped into the oiler where it sprays the top and bottom surfaces of the stock that passes through it. Excess oil is squeezed off and drains back into the pump reservoir, where a series of baffles settle out solids before the oil is



recirculated. Stock of 6, 12, and 24-in. widths and 3/16 in. thickness can be handled. The pump is a ¼ hp driven gear type that delivers 90 gph and is available in 5 or 12 gal containers.

Oscillating-Trough Conveyer

HANDLING a variety of materials in a horizontal path is accomplished with a new conveyer, called the PA Positive-Action Oscillator, announced by *Link-Belt Co.*, 307 N. Michigan Ave., Chicago 1. The Oscillator is a positive action, roller bearing, eccentric type oscillating trough feeder-conveyer, driven by a Link-Belt electrofluid drive through a chain or V-belt reduction to the machine's eccentric shaft and connecting rod assembly. The trough is either pan type or with channel steel sides. It is available in widths of 12 to 48 in. and in single trough lengths of up to 100 ft. The new conveyer may also serve as a cooler, dryer or conditioning unit when jacketed, louvered or otherwise constructed for the service intended.

CHARACTERISTICS of

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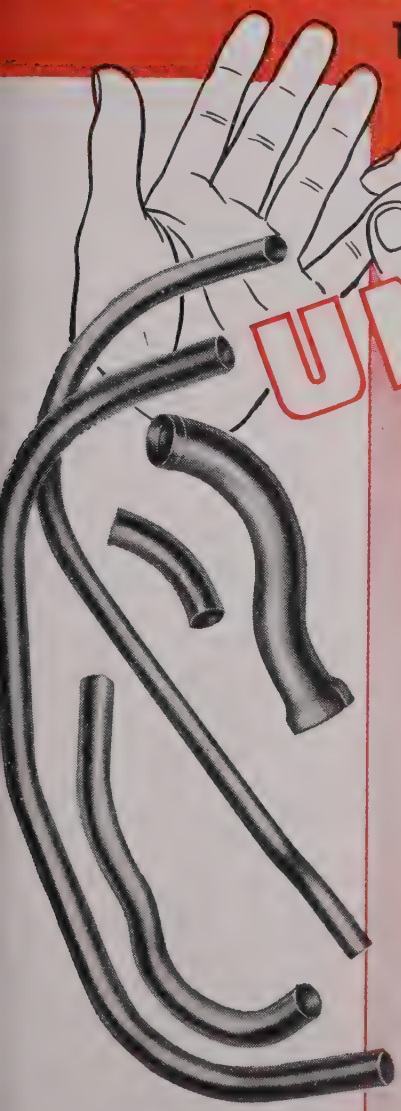
The Modern Electric Resistance Welded Steel Tube



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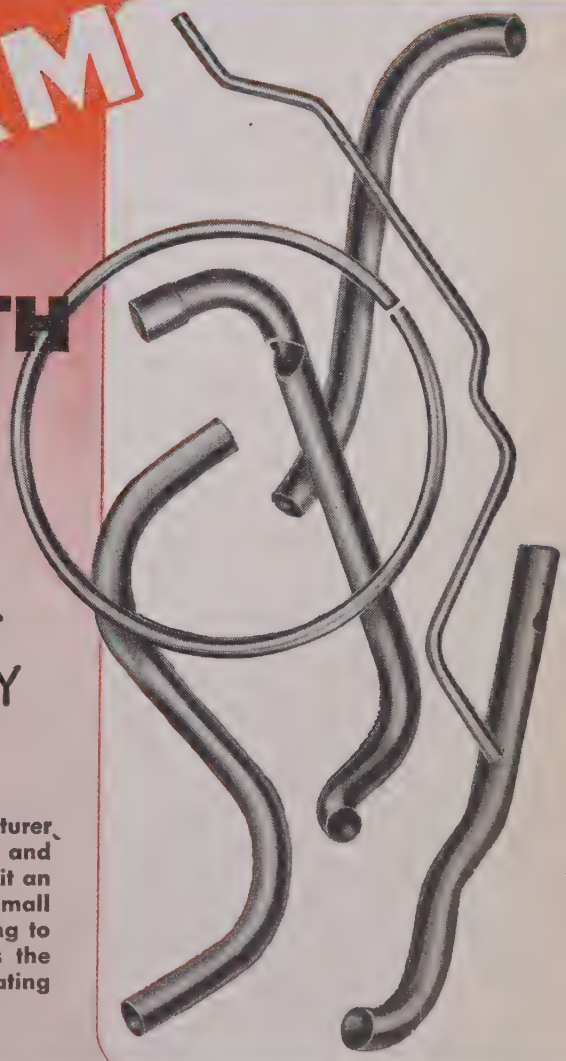
- **STRENGTH**
- **WEIGHT**
- **DUCTILITY**
- **I. D. *and* O. D.**
- MACHINABILITY
- WELDABILITY

Today — when every manufacturer is seeking shortcuts in production and additional economies that will permit an equitable price reduction, many small shops and large factories are turning to electric resistance welded tubing as the low-cost solution to their fabricating problems.



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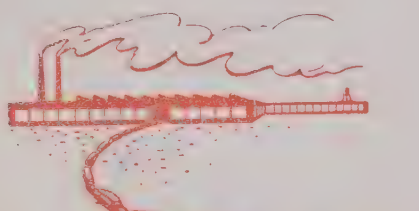
Assembly Line . . .

WALTER G. PATTON

• Temporary boom seen in auto output . . . Ford boosts prices of its new models . . . Weight reduction in cars would have many advantages, according to Chrysler engineer.



DETROIT—Reopening of the Chrysler plants this week has set the stage for what most observers here think might be the peak auto production thus far during the year 1948. With Chrysler plants pushing production to make up an estimated 18,000 units lost by the recent strike and Ford hitting stride on its new '49ers, things were looking up for the auto industry, temporarily at least.

Completely lost from sight among the news of strikes and production disappointments was the fact that passenger car production in this country last week exceeded the 1,500,000 mark. At this time last year, according to estimates prepared by Automotive News, car output was still 12,500 units short of this mark.

At the same time, truck production was well ahead of the 1947 level, with total U. S. commercial car output aggregating 616,977 compared with 550,133 for the corresponding period of last year.

Over the horizon, however, things were looking less rosy. The long shadow cast by John Lewis and his miners hung over the industry like a pall as the auto builders waited to see whether Big John, the government or the public would win the next round of the perennial tussel over wages. The auto industry was not too optimistic that Big John would be prevented from strangling the U. S. economy again.

Meanwhile, the effects of the last coal strike plus the continued high demand for steel has succeeded in cooling off most of the hopes of steel buyers here who had looked for a better third and fourth quarter. Except for a few steel salesmen with reputations for optimism, no steel buyer could be found here this week who could see any break in steel.

"Tighter than at any time this year," was the usual appraisal of the steel supply picture. And no one was predicting any improvement, as long as car production schedules remained high and new inroads were constantly being made by foreign commitments and steel siphoned off for the railroad car, building and oil industries.

Also heard this week was the rumor that a considerable quantity of steel might be required to build combat vehicles for the rearmament program. If this happens, the high hopes entertained early this year that the amount of steel required for new trucks would be less this year will vanish completely. Certainly the promise of less steel for truck builders in 1948 has not materialized up the present time.

* * *

THE boost in prices of the new Ford comes as no surprise. Several months ago it was indicated that the new price tags would be higher, with the amount of the increase depending primarily on what happened to wages. If the wage line had been held as it was in the case of the steelworkers, it is reasonably certain that the price advance in the case of Ford would probably have been well under 5 pct. The actual increase in Ford prices of 8.7 pct announced recently does not take fully into account whatever concessions Ford may make in wages. While it was hardly possible to compute labor costs exactly in announcing its Lincoln and Mercury prices, most sources believe Ford would hesitate to boost the prices of these models at least for the time being.

It is a reasonable assumption that prices of all new models wi be hiked, the amount being de pendent somewhat on the deman for cars, wage increases, the com pany's competitive price positio and public reaction to the price an nouncement. At the moment, looks like most car producers, wit the possible exception of Chrysle will withhold any price announce ments until their new postwa models are ready. If this happen it may leave Kaiser-Frazer as th sole defender of the auto price lin during 1948.

Passenger car list prices for th new Ford models are as follows Six Cylinder Models—Deluxe coup $1214; two-door, $1274; super d luxe two-door, $1393; four-doo $1458; sedan coupe, $1415; and st tion wagon, $1995. V8 Models—D luxe coupe, $1293; two-door, $1352 super deluxe two-door, $1496; fou door, $1529; sedan coupe, $1496 convertible, $1838; and static wagon, $2077. These prices do n include federal tax, state sales ta freight and any accessories or dea er handling charges. It is a reaso able guess that the delivered pri to the buyer in any given locali will be at least $200 higher tha the figure shown here.

Announcing the new prices, Fo said that without a new wage boo wages and salaries had jumpe $120 million since 1946 and its a nual bill for materials and par was $145 million more than a ye ago. Cost of engineering and too ing for the new models was $90 m lion, according to Ford officials.

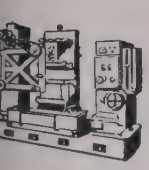
* * *

SPEAKING before the Society Automotive Engineers at Fren Lick last week, D. F. Toot, Proje Engineer for Chrysler Corp. ma it clear that auto engineers are n overlooking the possibilities of u ing aluminum in cars, provided balance can be obtained betwe cost and performance.

"If it is found that a part w function better if made of alum num than of steel, then everythi possible should be done to bri the cost down and decrease the di ficulty of manufacturing," accor ing to Chrysler's project enginee Mr. Toot pointed out that the

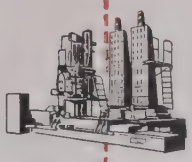
A message

to "the men who make dreams come true"

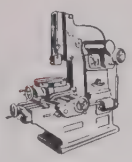


P&W
Automatic Duplicator

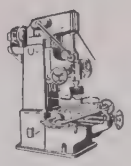
P&W
Die Sinker



P&W
Keller Machine

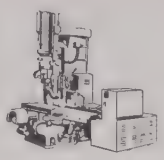


P&W
Vertical Shaper

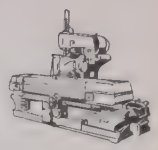


P&W
Jig Borer

P&W
Kellerflex



P&W
Jig Grinder



P&W
Surface Grinder

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It's our job to know how to build the kind of precision machine tools you need in your business. Our experience and products are the source for the tools, dies and molds needed to produce your products. Designs no longer need to be hampered by die limitations if your shop is Pratt & Whitney equipped. No matter what tooling problem you have, there is Pratt & Whitney equipment that will make it. Smart shop executives plan their replacement and expansion programs around this equipment. Pratt & Whitney precision pays dividends and cuts costs by the coordinated performance of tools and machines made to work together. Literature is available for the asking.

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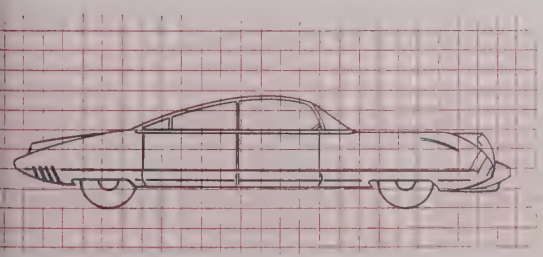
In 1946 the A.S.T.E. used this slogan as the Cleveland Show keynote . . . to describe the American Tool Engineer.



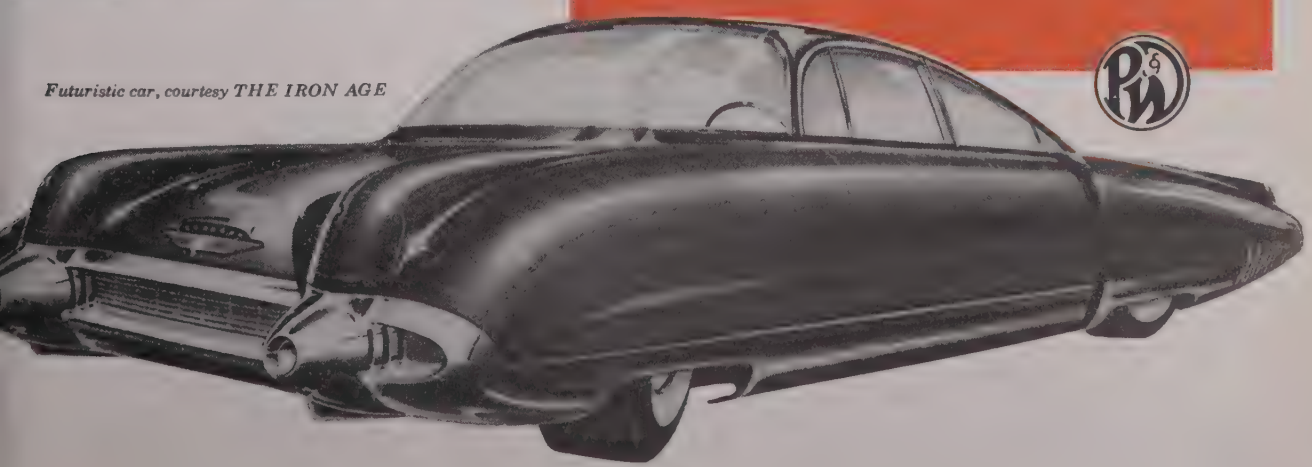
Even more than today, the car of tomorrow will be a product of better dies and molds. Increased knowledge of die design . . . improved coordinated tools by Pratt & Whitney . . . these make it possible to convert into metal and *mass produce* almost anything a designer can dream.

"There is no better-paying investment than the right tools for the job"

Pratt & Whitney

Die- and Mold-Making Equipment

Futuristic car, courtesy THE IRON AGE



strongest argument for the use of aluminum is the weight which is one third that of steel. "If we could reduce the weight of our cars 10 pct, we could gain a great number of advantages," he said. "We should gain in performance and be able to reduce the size of all suspension parts, including tires and wheels.

"The customer would also benefit by a weight reduction in lower registration fees in some states, on shipping costs and on fuel consumption, he said.

What will puzzle many observers is that despite the strong arguments that can be made for making cars lighter, Ford is so far the only producer who has introduced a postwar car that is lighter than its predecessor. The new Ford weighs 239 lb less than the previous model.

* * *

ARRANGEMENTS have recently been completed whereby Briggs Mfg. Co. of Detroit will furnish built-up bodies for the Willys-Overland Jeep station wagon and the Jeep station sedan, in addition to a substantial volume of stampings for other Willys vehicles. Briggs expects to add 800 employees to take care of the additional work. Deliveries are scheduled to start Aug. 1 and production is expected to reach 250 units per day.

Half of the Briggs production will be built-up bodies for Willys Jeep station wagon and station sedan. The remaining 50 pct will be made up of knock-down panels, roof panels, floor pans and doors for the Willys panel delivery truck, instrument panels for Jeepsters and supporting members for 2-wheel drive and 4-wheel drive trucks.

A number of these parts have previously been made by Hayes Mfg. Co. of Grand Rapids. The necessary dies, jigs and fixtures are now being transferred to Briggs, it was disclosed. The stampings will be produced at Briggs' Mack and Outer Drive plants; built-up bodies will be assembled at the Meldrum plant.

* * *

USE of a radioactive isotopes in gages for measuring the thickness of sheets of pliofilm has been announced by research engineers of the Goodyear Tire & Rubber Co.

Mechanical gages, it is reported, have not been satisfactory for measuring the thickness of pliofilm sheets which average one thousandth of an inch.

The new radioactive gage makes it possible to gage a sheet of pliofilm as it comes from the rolls. No mechanical contact with the film is necessary.

Utilizing carbon 14, a weak producer of beta rays and measuring the number of electrons passing through the film, Goodyear scientists are able to determine by direct reading the thickness of the film as it comes from the rolls. The gage is said to be accurate to a millionth of an inch. Cost of the gage is estimated at only a few hundred dollars.

Open House at Bliss Attended By Midwest Pressed Metal Group

Toledo

• • • **More than 150** executives representing the leading manufacturers of pressed metal products in the midwest area visited E. W. Bliss Co.'s "open house" here recently. Visitors were taken on a conducted tour of manufacturing operations beginning at the pattern shop, foundry and laboratory, and continuing through the main plant to the machine shops and assembly floors.

Bliss has invested approximately $1,250,000 in equipping the Toledo works with heavy machine tools, foundry equipment, and rearranging plant layout for more efficient production of its mechanical and hydraulic presses.

Visitors were told that the addition of sand conditioners, sand aligners, oil heated core ovens and new cupola will contribute approximately 25 pct in increased production.

Test bars of metal made in the foundry are subjected to physical and chemical tests designed by the Meehanite Metals Corp. to control the properties of each casting. The combined capacities of the Toledo and Hastings foundries provide high grade Meehanite castings for the production of presses in Bliss plants at Cleveland and Salem, Ohio, which, together with the Salem weldment plant, gives the Bliss Co. a highly integrated operation and control over all phases of its manufacturing.

The turret lathes, planers, boring mills, and gear cutting equipment installed at the Toledo plant in recent months represents a capital investment of approximately $900,000, according to Marshall M. Smith, company president.

An improved flow of material from the rough casting through the various machining operations to assembly and shipping departments has been achieved by a rearrangement of machinery and aisle space.

Guests were invited to inspect several 500-ton forming presses in the final stages of erection prior to shipment to the Studebaker Corporation, South Bend, Indiana.

The plant expansion at Toledo is part of a company wide program resulting from Bliss management's decision to cease operations at the Brooklyn plant in order to more economically serve the heavy concentration of metal working industries in the midwest. Similar new equipment programs have also been completed at the company's plants in Salem, Ohio, and Hastings, Mich.

Cuts Off Steel Supplies

Detroit

• • • **Great Lakes Steel Corp.** has cut off steel supplies to Wayne Sheet Steel Co. following recent testimony in the congressional hearing in the gray market steel operations. The announcement was made by George R. Fink, president of Great Lakes.

E. L. Wetstein, vice-president in charge of sales, had declined on the witness stand in Washington to stop selling steel to Wayne Sheet Steel Co.

Mr. Fink said that Great Lakes contact men had checked Wayne Sheet Steel Co. on several occasions and had been unable to obtain any evidence of gray market operations.

Mr. Fink explained that the production of prime sheet steel for the auto industry normally results in large tonnages of "seconds" and waster sheets which auto plants would not accept.

"They would have to work and polish them so much they would be spending dollars instead of cents to salvage it," he said.

Mr. Fink explained the company's policy is to offer the seconds sheets to regular customers; if the customers don't take the off-grade steel it is offered to warehouses, he said.

Great Lakes has notified Wayne Sheet Steel Co. it was being cut off the customer list and that the action had been confirmed by a telephone call.

3 TONS N-A-X HIGH-TENSILE
4 TONS CARBON SHEET STEEL

Switch to N-A-X HIGH-TENSILE. Utilize its greater strength and corrosion resistance by designing lighter sections. Boost production per ton as much as 33%. Get a stronger, longer-lasting finished product.

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MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N-A-X
HIGH-TENSILE STEEL

The "New Arithmetic in Steel" - makes every fourth part a Bonus part

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Washington . . .

EUGENE J. HARDY

• White House report forecasts need for steel controls . . . Deficit over next 12-months expected to increase at least 1.5 million tons . . . Decline in demand not likely.

WASHINGTON — White House advisers have tentatively decided to recommend to the President mandatory controls over the nation's steel output. The proposal has come about as a result of a committee report which estimates steel output for the fiscal year beginning July 1 at 65,200,000 product tons, with so-called government "must" programs requiring 16,020,000 tons, or about 25 pct of total output during this period.

This secret report was made by a subcommittee of the Ad Hoc Committee on the Need for Further Economic Controls, headed by Glenn McLaughlin of the National Security Resources Board. The report contained no recommendations, but it is understood that the full Ad Hoc Committee, headed by White House adviser Robert Turner, has decided to recommend steel controls to the President on the basis of information contained in the interagency report which covers the supply and demand picture for the fiscal year 1949.

The estimated output of steel products of 65,200,000 tons is on the basis of full production without any major work stoppages and represents an increase of 2,100,000 tons over shipments for the calendar year 1947.

The tonnage required for government programs is broken down as follows:

	Tons
Voluntary allocations agreements.... (freight cars, petroleum and gas, farm machinery, housing, atomic energy, barges)	8,520,000
ECA exports	2,300,000
Other exports	3,680,000
Military	1,320,000
Maritime Commission (shipbuilding)	200,000
Total	16,020,000

THE report further states that there is nothing to indicate a falling off in demand for steel during fiscal 1949, but rather that demand in the major consuming industries will increase during that period. The failure to meet demand in the auto and container industries is cited as a primary example.

Total export requirements, as contained in the report, including ECA, will be a little less in fiscal 1949 than actual export shipments during 1947. The estimated total for voluntary allocations programs is about a 2 million ton increase over actual 1947 shipments to the industries involved. The report points out that this tonnage just about offsets the estimated gain in steel supply.

Therefore, the report concludes that the shortage situation will be aggravated during fiscal 1949 to the tune of about 1,500,000 tons, the amount required for military and maritime needs.

In addition, the report expresses the opinion that steel shortages may be further intensified due to the following factors: (1) Production losses due to strikes this year; (2) the tonnages required for voluntary agreements are not equal to full requirements; (3) other industries may have to be brought into the voluntary program; and, (4) the tendency on the part of large consumers to purchase steel production facilities.

FINALLY, the committee believes that the voluntary allocations program will be subject to increasing strain as the number of agreements is increased and additional tonnage is taken out of the free market to satisfy these essential needs.

In estimating output of 65,200,000 million tons for fiscal 1949, th committee took into consideratio all contemplated increases in pro ductive capacity. Suggestions wer also made to further boost produc tion by improving the utilization o existing facilities.

Along these lines, it was report ed that current government effort to increase the supply of scra from abroad should finally amoun to something. The committee ex pressed doubt, however, that legis lation would solve the scra shortage.

The quality of coking coal coul be improved by limiting exports fo metallurgical use and restrictin domestic use for nonmetallurgica purposes, according to the report Assistance in the procurement o coal washing facilities is also sug gested.

Blast furnace output could be im proved by introduction of high to pressure, the report continues, and pointing out that delivery time o blowers required for this proces runs longer than 18 months, sug gests the adoption of any measure which would hasten the deliver and installation of such equipment

With the possibility of increas ing open-hearth output as much a 30 pct by the use of oxygen, th committee states that assistance i the procurement of oxygen-makin equipment would also be of grea value.

* * *

VIRTUALLY eliminating th duplication of military buyin programs, the new uniform pro curement regulations for the mil tary establishment and the Muni tions Board have been completed effective as of May 19. In genera they continue most of the join buying practices established durin wartime, including large scale con tract negotiation.

The board has already set up co ordinated buying methods in th major categories of military good which comprise 83.9 pct of th dollar value of Army, Navy and Ai Force requirements. Three chap ters of the regulations have bee printed in loose leaf form and dis tributed to procurement officer The remaining 11 chapters wi have been distributed by Aug. 1.

Under the new regulations, on

Get the EXTRA CAPACITY you need for more production with...

Hobart Arc Welders

rive port-
oduction,
nce and
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2

Gas engine drive welder with Auxiliary A.C. Power generator for operation in the field where electric power is not available.

5

Gas engine drive AC arc welder and AC power unit combination for welding and operating lights, tools and appliances.

3

Gas drive welder for welding in the field at lowest possible operating cost when electric power is not available.

6

Industrial type AC arc welder for heavy duty manual or automatic welding on production in industrial plants.

4

"Build Your Own" gas engine drive arc welder using this generator. Saves you $300 to $500 over cost of factory built job.

7

"Weldmobile," a complete portable welding shop with 300 amp. welder and space for oxy-acetylene tanks and equipment. It is self-propelled.

More copper; less R.P.M.; runs cooler

These are the important advantages to look for in an arc welder from a production standpoint, because production welding requires constant operation over long periods of time. On long runs, some arc welders operate at high temperatures; are less efficient and slow down production.

For this reason alone, you should compare welders point by point before selecting any for production welding. Check the amount of copper used - - a sufficient amount is required for cool operation. Check the R.P.M. - - the faster it turns the hotter it gets. Check the ventilating system - - the flow of cool air determines the amount of heat laden air.

Ample copper, low R.P.M., open internal design (air passages through the inside of both motor and generator cores), and controlled draft result in remarkably cool operation of all Hobart Arc Welders. Comparison proves it.

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If not, you had better check the chart now and try them on your most difficult jobs. If you'll try them, you'll like them!

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Please send me complete information on the new Hobart Arc Welder . . . number is circled below.

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Circle No. of Machine 1 2 3 4 5 6 7

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system of military specifications will be used for all services; policies and procedures will be directed by the Munitions Board. Existing or new specifications will be used until superceded by or revised under the new setup.

The board also reports that work is well advanced on the development of a common catalog system and standardized equipment for the armed services.

The new regulations require the use of the uniform contract clause, forms and termination procedures. They also institute a uniform procedure in handling patents, copyrights and patent exchange agreements, procurement advertising and in negotiation.

Under the 20 major categories for which the board has already set up coordinated procurement methods, one service now purchases items for common use by all services equalling 64.6 pct of the dollar value of current procurement.

Another 13.4 pct is currently purchased by joint procurement, that is, by the service designated to purchase assigned items for all three services. Finally, collaborative procurement currently accounts for 5.9 pct of the total.

To date, the following items have been assigned under single purchase responsibility:

Army: Subsistence, mess and galley gear, watches, recreational, sporting and athletic goods, chemical warfare supplies, lumber and allied products, railroad transportation equipment, and automotive equipment;

Navy: Combat ships and landing vessels, solid fuels, clocks and chronometers, marine life saving equipment, and hand tools; and

Air Force: Photographic equipment.

Under single purchase assignment but split according to plant dominance held by the services are:

Aircraft, parts and accessories, between Air Force and Navy; ordnance equipment (except automotive) and ammunition, Army and Navy; construction, mining, excavating and related equipment, Army and Navy.

Medical supplies and petroleum products are purchased under joint procurement. Textiles and clothing, office supplies and electronics equipment are currently under board study for assignment of method.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WAIT! LOOK AROUND FOR A MACHINE WITH A BIG CUT GOIN'!
THAT GUY SURE MUST NEED GLASSES-- HOLDIN' A BLUEPRINT THAT FAR OFF TO READ IT!
NO, HE'S HIDIN' THAT JOB! A TOOL STEEL SALESMAN IS HERE, AN' TO DEMONSTRATE HIS STEEL HE'LL RIP THAT AFTERNOON'S SNAP OFF IN TEN MINUTES!
SHOP OFFIC
6-18
J.R.WILLIAMS
THE LEISURE KILLER
T. M. REG. U. S. PAT. OFF.
COPR. 1948 BY NEA SERVICE, INC.

UNDER provisions of the regu tions, each department will su mit an annual report to the boa for use in making up a combin armed services report to the Pre dent showing the value of contra placed each year with small bu ness; a report showing value of contracts made under authori tions for negotiation; a semiannu report on research and developme contracts; and, a semiannual rep on all contracts negotiated in t interest of national defense or dustrial mobilization.

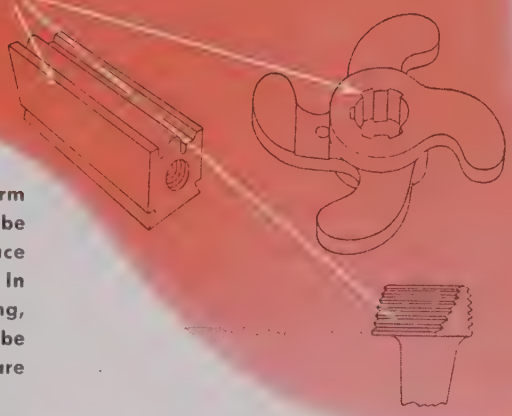
Sources of supply must be c fined to manufacturers and regu dealers. The latter are defined (1) those regularly carrying sto of the goods to be bought and h ing a warehouse or place of bu ness for sales purposes, (2) bona fide manufacturer's ag regularly employed on a salary commission basis, provided agent has authority to bind manufacturer in a contract, or, who, in certain lines, such as m chine tools or lumber, can meet quirements of the Walsh-He Act.

Generally, procurement must made through advertised biddi and awarded to the lowest bidd The policy of each department v be to place a fair portion of bu ness with small business (firms e ploying 500 or less). Procureme orders are to be divided into of such size as to encourage b ding by small concerns.

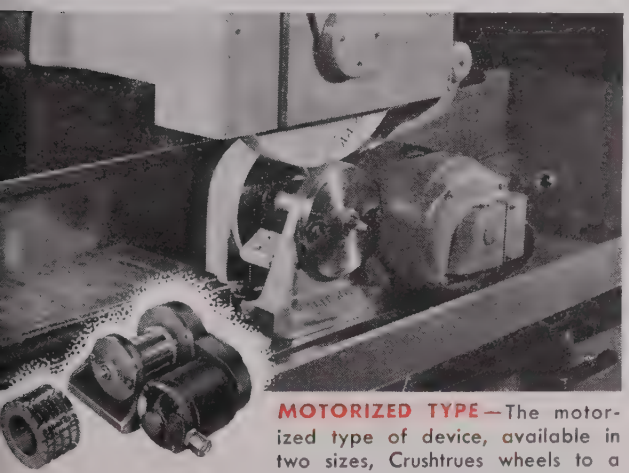
Contracts negotiated may be any type which will promote best interests of the governme The fixed-price type of contract v be used for negotiated contra unless conditions necessitate use of some other type of contra however, the cost or cost-plus fixed-fee or the incentive type contract will not be used exc when it is considered to be costly than other methods, or it impractical to sceure supplies services of the kind or quality quired without the use of such t of contract. Under no circu stances will the cost-plus-a-perce age-of-cost contract be used, or lowed to be used for any subc tract.

Advance payments are permit on negotiated contracts in amou not exceeding the contract pri providing that (1) adequate se rity is obtained, (2) it is in public interest, or (3) it is in interest of national defense.

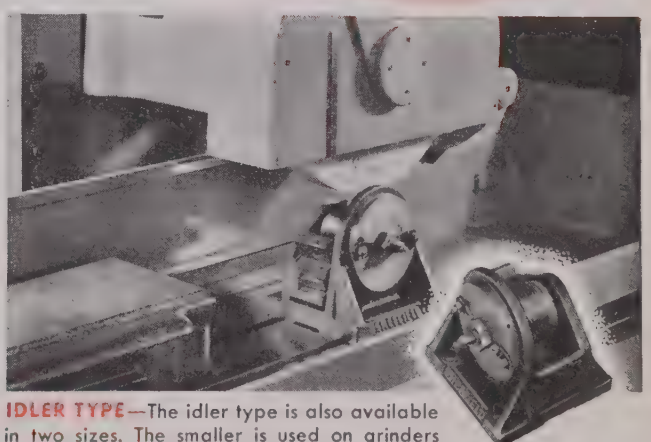
Speed jobs like these ON YOUR SURFACE GRINDER



Production and toolroom forms for flat work including form tools, punch and die sections and similar work, can be ground by a Crushtrued wheel on any standard surface grinder equipped with one of these Crushtrue Devices. In this way, the many advantages of Crushtrue grinding, including its speed, accuracy and marked economy, can be utilized with a minimum of outlay for tooling. There are three general types of Crushtrue Devices.

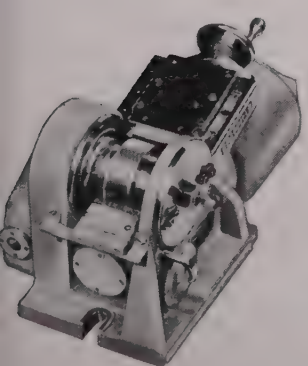


MOTORIZED TYPE—The motorized type of device, available in two sizes, Crushtrues wheels to a width of 3⅛" and is generally used for quantity production operations.



IDLER TYPE—The idler type is also available in two sizes. The smaller is used on grinders employing wheels up to 1" face. The larger utilizes wheels up to 3⅛" face. The units are generally used on grinders which have a slow speed spindle drive (approximately 300 fpm).

SELF-TRUING TYPE



The self-truing type is engineered especially for producing parts which must be held to a very high degree of uniformity. It incorporates a flat carbide form tool which is used to periodically reform the cast iron Crushtrue Roll without removing the roll from its mounting.

CRUSHTRUE ROLLS

Sheffield is prepared to regrind promptly, any Crushtrue Roll after it has become sufficiently worn in service. In addition to that, a large stock of standard rolls is maintained for immediate delivery or in exchange for rolls sent in to be reground. The Bank includes all Standard U.S. threads from 8 to 32 pitch inclusive.

Sheffield **would like to send you new literature describing Crushtrue grinding and its outstanding economic advantages.**

Thread and Form Grinders
Microform and Visualform Grinders
Gear Chamfering
Burring and Burnishing Machines
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West Coast . . .

ROBERT T. REINHARDT

• Financiers from San Francisco tour Pacific Northwest industry to learn about opportunities for venture capital and find eager reception as business parades accomplishments.

SEATTLE — Reverting to the home-spun belief that the way to get business is to go out looking for it, members of the San Francisco Stock Exchange headed by president Ronald E. Kaehler, and representatives of several California banks, recently invaded the Pacific Northwest, inspected seven plants in a crowded 3 days despite floods, strikes and fouled-up airline schedules and undoubtedly convinced at least a few industrialists that western money was available to finance western developments.

Spurred on by the knowledge that one or two important industries of the Northwest had recently gone East for assistance in underwriting expansion programs and encouraged by the results of similar trips throughout California, the financiers of Montgomery St. in San Francisco decided a little missionary work in the Portland, Ore.; Seattle, Everett and Bellingham, Wash., areas was in order.

Twenty-nine stock exchange members, brokers or bankers, left their Homberg hats in San Francisco, and accompanied by five top financial editors of San Francisco Bay Area newspapers and the West Coast editor of THE IRON AGE, spent 3 days hiking through plant after plant; endured hours of speeches; and averaged 2 hr of sleep per night; all in the cause of business development.

Whether the physical, mental and monetary expenditures will return a profit can only be determined by watching for new listings on the San Francisco stock exchange, but there is no question but what the tour revealed some interesting and illuminating facts about industry in the Pacific Northwest to the denizens of board rooms and money counters.

Not so many years ago such a trip would have included only those plants producing wood products or possibly processors of agricultural or fishing enterprises. Not so this time—of the seven plants inspected, four were directly or indirectly dependent on the timber resources of the area and thre were concerned almost entirely with metal fabrication.

In Portland the group skirted the flooded waters of the Willamette River for a tour of the Crown Zellerbach Corp. plant at West Linn where two new million dollar presses are turning out coated paper for Time, Inc., presses in Los Angeles and Philadelphia at the rate of 30,000 tons annually. Timber resources based on reforestation, and abundant water power from the Willamette Falls ravor the industry here. Another industry dependent on local timber supplies which was fully covered by the financial men was that of the Doernbecher Mfg. Co., reportedly the largest domestic producer of low and medium priced dining and bedroom suites. On a production line basis this operation consumes ¼ million board ft of lumber per day and among other things uses about 3 million wood screws per week. Plans are afoot to install their own screw making machines. Specialized machines such as one which surfaces four sides of wood blocks with machine-gun speed are common. This unit was designed by Roy E. Fulton, plant engineer.

HYSTER CO. was the only metalworking plant visited in Portland where assembly line methods of building industrial truck straddle trucks, mobile cranes a special units for use with Cate pillar tractors were explained. Pri cipal shortage in metal supply w said to be 1-in. plate.

Flood waters of the Willamet and Columbia Rivers were taking heavy toll on heavy industry in t Portland area with plants on t banks of those streams either is lated from shipping facilities actually down because of real threatened damage. Reynolds M tals Co. had to shut down its Trou dale aluminum reduction plant b cause of the fear that flood wate would reach the pot lines and cau an explosion, although the Alum num Co. of America continued o erations at its Vancouver, Wash plant across the river relying the defenses of its own dikes. Ste warehouses and small fabricato along the banks of the Willamet have had to close up shop primari because they were surrounded flood waters and shipments we impracticable.

Actual damage is difficult to es mate, but conservatively sever million of dollars will have to expended to remove sludge and d bris from many industrial plan and to repair machinery. Oper tions of the Henry J. Kaiser co trolled Consolidated Builders Swan Island where shipbreaki has been under way were broug to a standstill by rising water a much of the machinery and equi ment which had been removed fro ships scheduled for scrapping w returned to the decks of the doom vessels for safe storage during t emergency.

Picket lines failed to prevent visit to the Boeing Airplane C plant in Seattle where some 50 employees were at work in spite the strike of the Aeronautical M chinists (IAM) which began Ap 22. The party was taken throu one of the Stratocruisers bei readied for delivery to Pan Ame can Airways and given a glimp of the Army's B-50 long ran bomber.

First of the B-50's to be deli ered since the strike started w wheeled out on the runway for te

Why $17.00 when you can do it for 46¢?

15 K. W. TOCCO unit brazing tools.

with TOCCO* Induction Heating

A large midwestern manufacturer of automotive parts reports the following savings from salvaging high-speed lathe tools with TOCCO induction heating:

> "The large tool shown here costs $17.00. It is eight inches long but formerly was discarded after four inches had been used. Now we use it all; the four inch stub is TOCCO-brazed to a four inch shank and we have a new tool for the cost of grinding and brazing—46¢, of which only 6¢ is the cost of TOCCO-brazing.
>
> "This process, applied to the many high-speed tools we use, provides a monthly savings of $2,000. The TOCCO Machine paid for itself completely in less than two months."

TOCCO Engineers stand ready to analyze *your* soldering, brazing or heat-treating problems to produce similar cost-cutting results.

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TOCCO

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flight June 7 after the party of financiers had visited the plant. In a brief ceremony marking the event, William M. Allen, company president, told assembled employees that if the local strike doesn't soon end there will be more employees at the Witchita, Kan., plant of the company than there were here before the strike began. Employment at Witchita has risen from 2000 to approximately 4000 since the local strike started.

CONSENSUS of industrialists and business men here seems to be that the strike which is costing workers about $4.5 million per month will be a long one and will be broken rather than settled because of the firm stand taken by Boeing and the weak position of the local union which called the strike on the basis of an election held in May of 1947 when it had about 6000 members whereas the walkout was ordered Apr. 22 when total employment at Boeing was approximately 19,000 and union membership was 14,800. The back-to-work movement is gaining ground as a result of advertising by Boeing informing prospective new employees and former employees that they would receive a wage increase of 15¢ per hr and through the efforts of Dave Beck, AFL chief in this area who is encouraging a return to work movement and offering support of his strong Teamsters Union to those who do so.

While Boeing officials will not publicly say so, it is estimated that the strike has cost the Army about six of the B-50 bombers. Only one has been rolled off the lines since the strike started in April and production up to then had been at the rate of approximately seven per month.

Although businessmen of the area are mindful of the loss in retail trade caused by the strike, there is a feeling that this situation is one which demands wholehearted support of Boeing in the interests of eliminating the stigma which accompanies a nationwide reputation for poor labor relations. With the latest increase in hourly wages being paid by Boeing, the company now finds itself in the unenviable position of paying a rate per hour higher than any airplane manufacturer in the country and at the same time enduring a seniority program within the union which defeats attempts at improving efficiency.

At Pacific Car & Foundry Co. here the visiting gentlemen of the counting houses found production at a high level with 13000 employees working two shifts rebuilding refrigerator cars, producing equipment for the logging industry, school bus and delivery truck bodies and power control units for use on tractors.

The government-owned steel foundry operated on lease is producing approximately 200 to 300 tons of castings per month and about 800 tons of steel ingots for England.

NO contracts for new rail cars are on hand, but the rebuilding program which is on an assembly line basis is moving along with 900 still on contract for Merchant Dispatch Transportation and Western Fruit Express. It is reported that cost of rebuilding a refrigerator car here is approximately $4000 and that new construction would approximate $7000. Under the pres-ent schedule eight "reefers" can be rebuilt per day and new cars could be built at the rate of about 12 per day. Only about 700 to 800 lb of new steel is required in the rebuilding operations, it is said.

Kenworth Motor Truck Corp., owned and operated by Pacific Car & Foundry, was shown to the visitors as an example of the adaptation of assembly line methods to custom construction. Among other notable features of the operations here were the extensive use of aluminum in truck chasis frames where as much as 10 lb per ft of chasis was saved, and the use of the torsion bar for springing which saves approxmiately 1000 lb per unit. Aluminum is used extensively for cab sheathing.

Although not being talked about too much, Kenworth let it be known that its seven-speed transmission is still undergoing both field tests and tests to destruction in its laboratory. One of its own buses equipped with this unit carried the visitors around Seattle and up to Everett, Wash. Details of performance, anticipated costs and availability still remain closely guarded secrets.

Both in Portland and Seattle, the financiers were welcomed with open arms as there is apparently a belief in the Northwest that more venture capital is essential to development of the area. Only criticism of the "goodwill" trip came from industrialists who would have welcome an opportunity to display the plants and expound their plans bu who had no opportunity to do so.

SALT LAKE CITY—The Uta Supreme Court will, it appea make the final decision as whether Geneva Steel Co. is liab for a 2 pct use tax on the purcha of the Geneva plant.

On advice of the attorney ge eral, the state sales tax commissio has entered a deficiency assessme against the purchaser of $423,52 of which $37,976 is for interes The company has asked that t assessment be set aside on t grounds that neither the law n commission practices support i position of the tax on an operati business; that the tax violates bo federal and state constitution that the assessment constitutes action against Geneva alone, as attempt has been made to tax si ilar sales of integrated businesse that RFC is not a retailer und the Utah law; that inasmuch as t property is located in Utah, it the sales and not the use tax th applies, if any tax is applicable.

The state's case for collecting t tax rests primarily on the conte tion that WAA is a retailer. cause the sale was made in Wa ington, the sales tax could not applied so the commission turned the use tax.

If the assessment sticks, seve other purchasers of war surp plants will presumably find the selves owing some back tax These include the Kaiser-Fra Corp., purchaser of the surp blast furnace at Ironton, and Simplot Co., purchaser of the lunite plant.

8 Million Work Days Lost

Washington

• • • **Including those** carried o from March, there were 400 w stoppages in effect at one time another, involving 625,000 worke and resulting in the loss of 8 lion days of work. Most of the i ness was centered in the bitu nous coal and meatpacker stri

Other large stoppages w strikes at the Peoria plant of Caterpillar Tractor Co., (17, workers) and the Boeing Aircr Co., Seattle plant (15,000).

Textile Machinery Manufacturer Specifies
FLASH BUTT WELDED RINGS
by AMERICAN WELDING

Heavy duty cotton mill machinery demands uniform, rugged, close tolerance construction in 5′ and 7′ cylinder end rings . . . That's the reason for specifying "American" flash butt welding. Fabricated by our Controlled Technique, this is but one application of many ferrous and non-ferrous American Weldments made to strict customer specifications. Our 31 years of welding research, engineering and production is yours for the asking. A representative will be glad to call; or send us your prints and specifications for prompt recommendations and estimate.

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for 16 page
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THE AMERICAN WELDING
AND MANUFACTURING COMPANY
120 DIETZ ROAD • WARREN, OHIO

PERSONALS

o o o

• **James C. Hartley** has been appointed vice-president, general manager and director of Barium Steel & Forge, Inc., Canton, Ohio. He is occupying the positions formerly held by **Glenn W. Shetler,** who has resigned. Mr. Hartley joined Barium Steel & Forge in 1946 in the capacity of chief metallurgist. In 1947 he was made manager of metallurgy and sales.

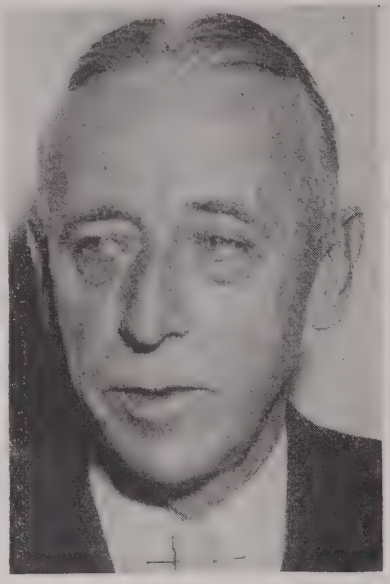
• **G. L. Bruton** has been appointed assistant sales manager, Ferro Enamel Corp., Cleveland. **E. C. Davidson** has been named manager, northern and central Ohio, western Pennsylvania and northern West Virginia territory of the company. Mr. Bruton has been with Ferro since 1936, having been previously associated with Detroit Vapor Stove Div., Borg-Warner Corp. Mr. Davidson also joined Ferro in 1936. He previously held positions with Servel, Inc., Baltimore Enamel & Novelty Co. and Republic Steel Corp.

• **John W. Mowry** has been named assistant district manager, Pittsburgh district, U. S. Steel Supply Co. Mr. Mowry joined Carnegie-Illinois Steel Corp. in 1930 and 2 years later transferred to the Pittsburgh district sales office. In 1933 he joined the staff of U. S. Steel Supply as a salesman.

• **H. F. Dobscha** has been named assistant district manager, Cleveland district, Republic Steel Corp. He succeeds the late J. H. Slater as assistant district manager and also as chairman of Republic Steel Corp.'s blast furnace committee. Mr. Dobscha comes to Cleveland from Carnegie-Illinois Steel Corp. **S. A. Seckler** has been appointed assistant district sales manager of Republic Steel's Chicago sales district. He has been connected with the Chicago sales office since 1935 and recently has been in charge of the Milwaukee office, a suboffice of the Chicago sales district.

• **Uri B. Grannis, Jr.** has been appointed manager of equipment sales for the American Brakeblok Div. of the American Brake Shoe Co. Mr. Grannis has been with Brake Shoe since 1935 and has served in various sales capacities. He will be located at the division's headquarters in Detroit.

• **Cecil F. Portlock** has been appointed general manager of the National Sheet Metal Co., Philadelphia.



WALTER C. HEMINGWAY, president, Pittsburgh Steamship Co.

• **Walter C. Hemingway** has been elected president of the U. S. Steel subsidiary, Pittsburgh Steamship Co., Cleveland, succeeding the late A. H. Ferbert. Mr. Hemingway has been vice-president and general manager of the Federal Shipbuilding & Dry Dock Co. He has been with U. S. Steel since 1909.

• **Charles L. Cooper** has been appointed purchasing agent for several Alabama subsidiaries of the Ingalls Shipbuilding Corp. of Birmingham. Mr. Cooper has been with Ingalls for several years as a buyer and assistant purchasing agent.

• **Bayard D. Kunkle** has been elected a member of the board and of the operations policy committee of General Motors Corp., New York. Mr. Kunkle is vice-president and group executive in charge of overseas and Canadian operations.

• **James H. Flagg** has been appointed district sales manager of the Philadelphia territory for the Sawhill Mfg. Co. Since the end of the war Mr. Flagg has been with the Mercer Tube & Mfg. Co. working in the operating and sales departments. He will also act as district sales manager for Mercer in that territory.

• **George H. Cruttenden** has bee appointed assistant manager, con struction material sales in the Ne York sales office of American Ste & Wire Co. Mr. Cruttenden starte work for American Steel & Wire i 1915 and has been in sales work fo the company since 1919. **Earl N Graf** and **Walter C. Anderson** hav been appointed to newly-create sales positions of American Steel Wire. Mr. Graf will serve as direc tor of wire rope sales for the east ern district of the United State and Mr. Anderson as director o construction material sales for th same district. Mr. Anderson starte work for the company in 1921 an has since served in various sale capacities. Mr. Graf has been as sociated with American Steel Wire since 1946.

• **Milton C. Carlson** has been ap pointed to the post of assistan sales manager of Signode Ste Strapping Co., Chicago. Mr. Carl son has been with the compan since 1939, and has successivel held positions as representative district sales manager at St. Loui and Chicago district sales manage

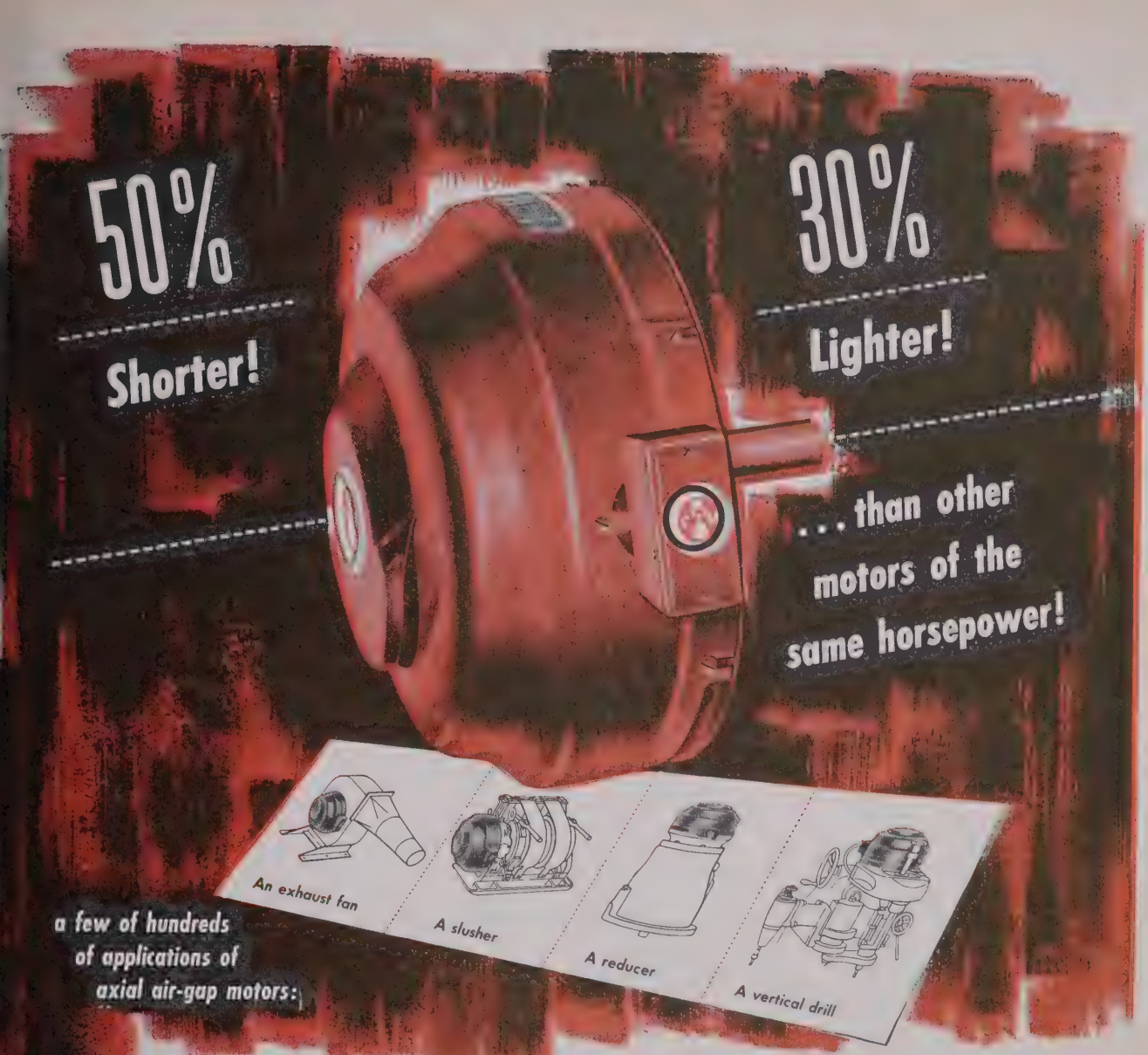
• **Malvern J. Hiler** has been ap pointed vice-president in charge o customer relations, Commonwealt Engineering Co., Dayton. Mr. Hile was formerly district manage Sharples Chemicals Inc., Chicag office, for 5 years and subsequent ly served as director of researc and chemical development, Stepha Chemical Co.

• **Torsten H. Parke, Bransford W Crenshaw** and **Herbert F. Blattne** formerly sales representatives, hav been elected to the office of assist ant vice-president of Scullin Ste Co. Mr. Parke is in charge of th New York office and Mr. Crenshaw will transfer from St. Louis to th Chicago office in the near future Mr. Blattner remains in the St Louis office.

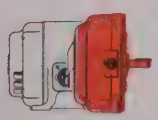
• **Preston R. Bassett,** president o the Sperry Gyroscope Co., has bee elected a vice-president of th Sperry Corp., New York. He wi continue to head the Sperry Gyro scope Co. division.

• **George A. Huggins** has been ap pointed general manager of the ca works plant of Pullman-Standar Car Mfg. Co., Chicago. Mr. Hug gins was associated with the Doug las Aircraft Corp. in California fo the past 20 years.

(CONTINUED ON PAGE 144)



THE FAIRBANKS-MORSE *Axial Air-Gap Motor!**



NEWEST THING IN ELECTRIC MOTORS! For many applications the desirability of smaller, lighter, more compact motors has been well recognized—but not until the development of the axial air-gap motor by Fairbanks-Morse engineers has the need been filled. Here, then, are motors that will blend with the contour of the driven member . . . motors that are lighter, smaller, and more compact . . . sturdy, two-bearing motors that will give more than the required performance.

Perhaps you have already heard of the axial air-gap motors. That would be because they have already been proved on thousands of installations during a long period of test. If you would like to learn more about them—or any of the widely known line of conventional Fairbanks-Morse motors—see your Fairbanks-Morse representative.

**Air-gap dimension is measured parallel to the axis of the shaft as compared to a radial dimension in a conventional machine.*

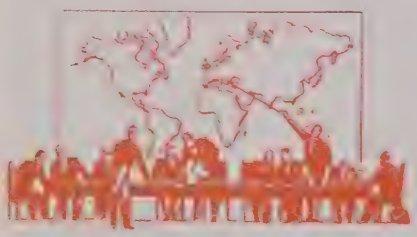
FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • STOKERS • SCALES • MOTORS • GENERATORS
PUMPS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

European Letter . .

• Russia placed on defensive and Communism receives sharp rebuff . . . New Six Power agreement represents compromise . . . Criticisms of American Policy may undermine whole strategy.



LONDON—Just a year has passed since Mr. Marshall made his speech at Harvard and in the intervening time, a new world has opened for Western democracy. Today, the Western world can look back on months during which Russia has been placed for the first time on the defensive and Communism, in two key states of Western Europe, France and Italy, has received a sharp rebuff. And now, after weeks of hard discussion, the five neighbors of the West —Britain, France and the Benelux countries — together with the United States, have made a big step towards agreement on the most intractable of all Western problems—the position of Germany.

The new Six Power agreement, announced recently represents a compromise between the two powerful forces: The American and British desire to revive the German economy and to associate Western Germany as effectively as possible with the European Recovery Program, and the French fear that such a policy would prejudice French recovery in favor of Germany's, invite Russian reprisals in the immediate future, and in the longer run restore power and the means of aggression to Germany.

The agreement attempts to counter both fears. An international authority representing the Six Powers and Germany will allocate the Ruhr's output of coal, coke and steel, and the military governors who support the Anglo-American policy of speedily reviving Germany will not be allowed to veto any Seven Power allocations, in whose determination France will play a decisive part.

IN the political field, French fears of a future powerful German Reich with a centralized government have been to some extent countered by the willingness of Britain and America to abandon their plan that a Constituent Assembly for Western Germany should be elected by popular vote. The various *Laender* governments will now have the power to decide whether their delegates to the Assembly shall be nominated by them or elected by the people. On the question of countering any possible Russian reaction, the French have apparently agreed not to press for specific American guarantees—though they are believed to have left the conference dissatisfied on this point.

One year after Mr. Marshall's initiative is a fitting occasion to measure not only the ground that has been covered but the immense tasks that lie ahead. In almost every field the Western Powers have committed themselves to policies revolutionary in implication, which involve quite new relationships between each other and which must of necessity take years to carry out.

The fact that the Powers have taken the first step is little or no guarantee that they will as certainly finish their course. The new Western strategy demands that the Sixteen Nations pledge themselves to associate in a new type of cooperative community, that the Americans persist in their present willingness to enter into long-term relations with that community, and that the problem of integrating the recalcitrant Germans into it will be satisfactorily solved.

Reprinted from The London Economist by special permission.—Ed.

The Marshall Plan put a stop to the spread of Communist influence and restored a measure of confidence to the non-Russian world. The Russians declared war on th Plan and spent 9 months usin every device to destroy it.

IT must be assumed that th Kremlin is no more friendl than a year ago either to the Pla or to the consolidation of Weste Europe. But violent attacks an opposition have had the effect o hastening both. The urgency whic drove the Economic Cooperatio Act through both Houses is notice ably absent in the leisurely discus sion of the actual allocation of th money in the Appropriations Com mittee, which is even considering cut in the total for the first yea No one should underestimate th deep underlying desire of th American people to reach an under standing with Russia, which woul then leave them in peace. Only relatively small and sophisticate minority realize that Russia's ap parent willingness to talk is condi tional upon the new firmness show by the United States in the fiel of Western relations and defens

In Europe, it is France, now th most uncertain and internally di vided of the Western States, tha appears to be most unsettled by th Russian peace offensive. The pres and not simply the left wing pres —has in recent weeks made uncom fortable reading. M. Bidault ha come in for heavy criticism on th charge that he is conniving at th "American determination" to di vide Germany and that if Russi reacts violently, it is France tha will bear the brunt.

The more the Russians pres their offer of a settlement, the mor French criticism may batten on th United States for refusing to com to terms. America may wake u one day to find a chorus fro France denouncing it as a "war monger." It is hardly necsesary t point out that these criticisms un dermine the whole strategy o Western consolidation. How ca Western policy survive successfull the full 5 years of the Plan, an the longer years necessary t achieve Western Union, if one o the key member states is for eve wavering on the brink of a decisio to abandon association and go off t the old pursuit of "building bridge between East and West"?

Half of this message has to do with NORTHWEST products and processes for chemically cleaning ferrous and non-ferrous metals preparatory to plating, vitreous enameling, painting, etc., each problem involving a specific programing of one or more of the thirty-five standard NORTHWEST Cleaning Compounds including Electrolytic, Immersion, Solvent, Spray, and Water Wash types . . . the "Lo-Hi" pH process of chemically cleaning metals, preparatory to plating, porcelain enameling, etc., makes practical a control that management can plan on in these departments regardless of the type of metal or soil.

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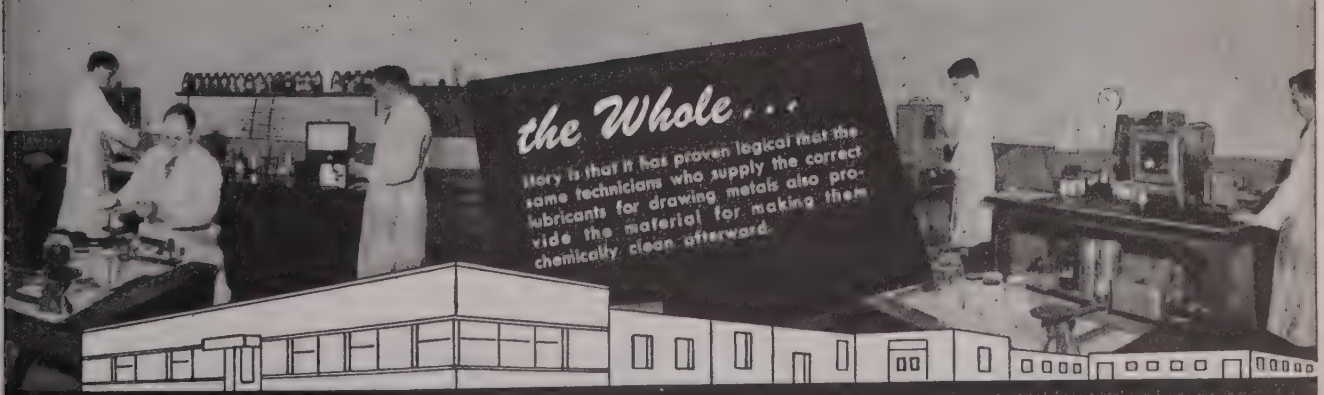
is concerned with metal forming lubricants developed for ferrous and non-ferrous metals in both pigmented and non-pigmented form . . . SUPER-DRAW products are specifically compounded for: 1. Brass and Brass Alloys, 2. Cold Rolled Steel, Enameling Iron, Stainless Steel and Aluminum, 3. Alloys of Steel, Aluminum and Copper . . . SUPERDRAW compounds will handle light, medium, and heavy operations . . . may be applied by brush, roller, spray, or dipping . . . A request on your letterhead will bring a technician to consult you on your drawing and cleaning problems . . .


the Whole . . .
story is that it has proven logical that the same technicians who supply the correct lubricants for drawing metals also provide the material for making them chemically clean afterward.

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Industrial News Summary...

- **Cease and Desist Order Studied**
- **May Be Issued Early Next Year**
- **Steel Demand Climbs to New Peak**

THE Federal Trade Commission is determined to change the selling practices in the steel industry. The cease and desist order calling for drastic changes has been drawn up. It is being studied by FTC members. Little or no changes are expected in the form, it is believed. The industry may find the order issued upon it early next year—if not sooner.

The order, THE IRON AGE has learned, calls upon the steel industry to (1) establish a plant price for steel at every mill (2) sell f.o.b. mill when requested and (3) cease the compilation and dissemination of freight rate information.

Such an order will be a blow at the present method of selling steel. Although it does not specifically outlaw the basing point system, such a ruling would so drastically change the relationship between steel buyer and seller as to produce an f.o.b. mill system with little or no freight absorption. At least that is the opinion at this time.

It is not farfetched to say that the possibility of changes in selling because of this impending FTC order and the seriousness with which steel leaders view the Supreme Court decision in the Cement Case transcend the anxiety caused last year by the portal-to-portal pay controversy. But this time an easy solution is not in prospect. Steelmakers are convinced to a man that legislation is the only answer to the FTC. Yet it would be foolhrady to rule out the remote chance that some steel firms might suddenly go to an f.o.b. mill system before the order is promulgated and before the steel basing point case reaches the Supreme Court, as it likely will.

NEITHER foreign scrap arguments, nor anxiety over a pending change in steel selling practices have had any effect on total steel demand. Steel sales officials have finally thrown up their hands in amazement at the continual stream of orders. Stark proof of the state of things this week is the widening of promises for stainless steel and alloy steel items. Only a few months ago these items were seized upon to show that the bloom was off the pumpkin as far as steel demand was concerned. In most cases promises for these products were this week two or three times as long as at the first of the year.

As to regular carbon steel products, the auto shutdowns are mute evidence that there has been no change there. As predicted, the auto shutdowns occurred as an aftermath of the coal strike. A new coal strike could be expected to eventually have the same effect. Current heavy demand is setting a pattern which supports the view that by the time the Marshall Plan and the defense program are underway we might as well be at war as far as availability of steel is concerned.

This week the steel operating rate stayed at 96.5 pct of capacity. But it is safe to say that the volume of new business is greater than that rate. If steel companies were to let down the bars and take all the business offered they would be swamped. Today the only orders booked are those which can be rolled on actual schedules. No change in this method of operation is in prospect.

THE controversy over foreign scrap seems to involve some sloppy thinking. Some steel leaders are not anxious to have scrap hauled over here from Europe—only to turn around and ship finished steel abroad under the ERP. Their thinking on this problem is cold logic: (1) Let Germany make steel for rehabilitation with what scrap she has; (2) if there is still scrap left, let German interests sell it to other European nations and (3) if there is still some left, let it be shipped to the U. S.

A lot of the scrap in Germany is buried under rubble. People who have been on the scene say that much of it is uneconomical to bring to this country. In Japan there are about 5 million tons of carbon steel scrap, but authorities there are expected to keep at least 3½ million tons of this material to help reestablish home industry.

In other parts of the world scrap is scattered far and wide. To get it together and to prepare it would cost too much by the time it was delivered to this country. The actual amount of scrap which will finally be returned to this country will be a far cry from the figures now being bandied about.

Every ton of steel ingots which are shipped abroad under ERP or under export regulations means a loss of 600 lb of immediate "home" scrap to American mills. Semifinished steel shipments abroad mean a scrap loss of at least 10 pct of the total tonnage shipped. When these are added together it means a shorter supply of "home" scrap at a time when dealers' scrap is hard to get and when there is still a pig iron shortage—that is why the trend in thinking is toward having foreign scrap used at its present location; thus relieving a part of the pressure for steel products from America.

Treks to Washington by steel buyers to try to get preferred treatment have started in earnest. They are beginning to take on the aspect of prewar priority junkets when almost every steel group hit the Capitol to get some steel or some more steel.

This is what steel company officials feared early this year when they predicted that government controls would be demanded in some circles. But steel operators believe that government controls would make a mess of things. They feel strongly that the voluntary system will work. And they know that they will be cordially disliked by some customers before the year is out.

DON'T BE TOO SURPRISED—Before the courts ıtlawed the Pittsburgh plus back in 1924, the steel inıstry was abandoning that way of selling. In 1923 it ught the 8-hr day but quickly folded up and put it into fect—thanks partly to the council of churches. In 1938 e United States Steel Corp. suddenly and officially elimated the differential between the steel prices at Pittsırgh, Birmingham and Chicago. But before that time in tual practice this had been done. Last month the same mpany cut out its differential between Geneva Steel ices and eastern quotations. In the past several years sing points have so increased in number that there is ry little resemblance to the basing point system of 10 ars ago. This week steelmakers will swear on a stack bibles that an f.o.b. mill system would ruin the industry. aybe it would. But despite the vehemance of the argueents against the Federal Trade Commission position it ould be foolish to assume that some steel firms might ot suddenly go f.o.b. mill with all the trimmings and then e what the "ruin or chaos" would amount to. If it orked, okay—if it didn't, FTC—or maybe even Congress would have to bail the companies out.

INVESTIGATION—The Senate decided to broaden its rthcoming study of basing point selling to include an vestigation of monopolistic tendencies. At least $50,000 ready has been set aside for a committee probe to get der way within the next few weeks. Senator Capehart, , Ind., is slated to play an important part in the instigations. The Senate's decision to widen the scope of e study came after Senator O'Mahoney, D., Wyo., and TC members claimed that an analysis of economic conntration was necessary to complement any inquiry into dustrial selling methods.

ELECTRICITY—A 72 pct increase in the use of electcity in this country by 1958 was forecast by Gwilym A. ice, president of Westinghouse Electric Corp. in a recent eech before the annual convention of the Edison Electric stitute. Mr. Price estimated that in the next 10 years tal annual sales of electric power will rise to approxiately 374 billion kw hr. Looking at the steel industry's oblem of treating low grade ores he observed that the ocess requires great quantities of electrical energy. The wer content of a ton of iron ore will be raised from the esent figure of 4½ kw hr to 70 kw hr.

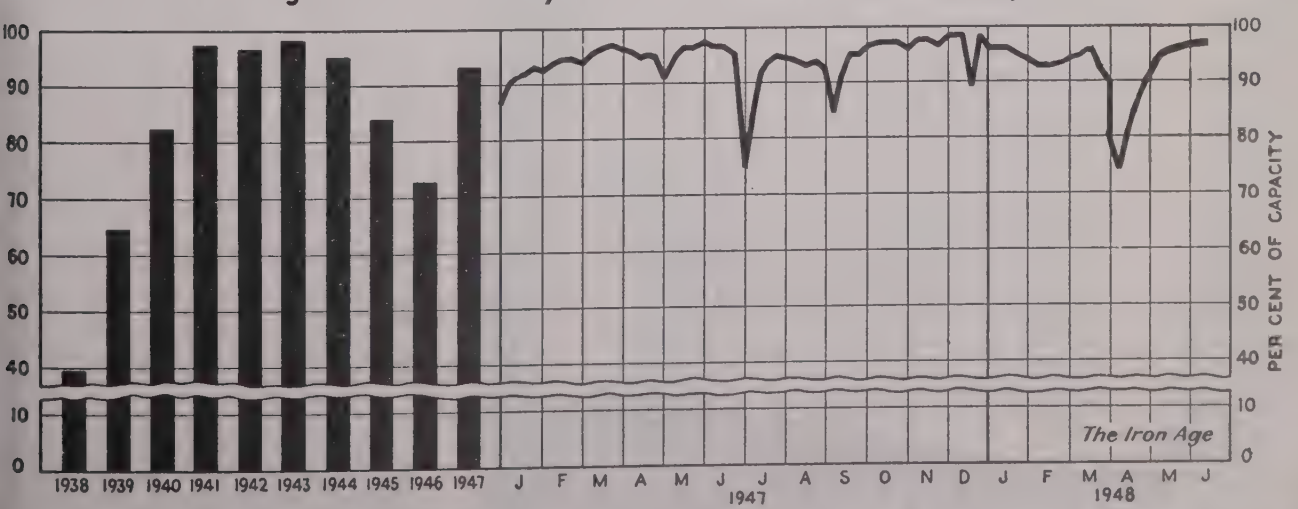
• **ANTITRUST SUIT KAYOED**—The Supreme Court held last week that purchase of the Consolidated Steel Corp. by the Columbia Steel Co. is not a violation of antitrust laws. "It cannot be said there would be an unreasonable restraint of trade," the court said in a 5-4 decision upholding U. S. Steel Corp., the parent company. The court took note of the dominant position of U. S. Steel but added that "the steel industry is also of impressize size and the welcome westward extension of that industry requires that the existing companies go into production there or abandon that market to other organizations." The minority opinion said U. S. Steel's dominant position on the West Coast "alone is sufficient to condemn the purchase."

• **NEW ORDERS UP**—New orders placed with manufacturers rose 5 ct during March, computed on a daily average basis, thus reversing recent trends, the Office of Business Economics reports. At the end of the first quarter, retail inventories had risen to $11.7 billion with a March rise of a billion despite a lower industrial production for the period. Both wholesale inventories and manufacturers stocks rose slightly during the quarter.

• **REHEARING REFUSED**—The Supreme Court last week refused to rehear the Federal Trade Commission's suit against the cement industry. The Court ruling came as a result of a denial of a petition filed by a cement industry asking for a clarification of the decision which outlawed the multiple basing point system. The industry asked for a ruling as to what pricing systems are legal in the light of the Apr. 26 decision. Justices Jackson and Douglas took no part in this decision.

• **MAY CONSTRUCTION**—Total new construction put in place during May is estimated by the Dept. of Commerce at $1.44 billion, a 40 pct jump over May last year. This brings the total for the first 5 months to more than $6 billion. Privately financed industrial construction continued to lag during the month; at only $114 for May, it was down 2 pct from April and 19 pct from a year ago; store and similar commercial building increased over both April and the first five months of 1947. Highway construction, at $377 million, is up 25 pct over the 5-month period last year; public utilities, at $888 million, recorded a gain of a third over the period.

Steel Ingot Production by Districts and Per Cent of Capacity



of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
.....	98.5	95.5	93.0	89.0*	95.0*	99.0*	100.0*	102.0	102.0	102.0	99.0	89.5	98.0	96.5*
.....	99.0	95.5	93.5	90.0	94.0	99.0	104.0	102.0	102.0	97.5	106.0	89.5	98.0	96.5**

d
ive

Precision Finish
Smooths Out Pencil Problem
CUTS PRODUCTION COSTS
PROBLEM: The Moore Pen Co. required tubing held to exact dimensional tolerances for the barrel of a new mechanical pencil. Specifications included:
● A scratch-free, mirror-like finish
● A surface suitable for color anodizing
● Ruggedness under severe usage
● Easy forming to required shape
SOLUTION: Precision Tube Engineers recommended special aluminum alloy tubing . . . developed a manufacturing procedure which provided tubing that exceeded the properties originally sought. Result—mechanical pencils of higher quality . . . greater sales appeal . . . lower costs.
Whatever your needs in small, accurately drawn, seamless tubing—for instruments, pointers, pens, pencils, metal shielded wire, or other products — Precision offers non-ferrous metal tubing to your specifications.
WHEN PRECISION COUNTS, COUNT ON PRECISION
PRECISION TUBE CO.
PRECISION
Factory: 3824-26-28 TERRACE STREET, PHILADELPHIA 28, PA.

SMALL TUBING APPLICATIONS

CHARLES T. FLACHBARTH
Chief Engineer

PRECISION TUBE COMPANY

The past thirty years have seen great strides in the number of products to which small, precision-made tubing could be applied. The effect has often been a development of new products utilizing the new methods made available by accurate tubing. In other cases, the substitution of tubing for existent parts has resulted in a better final product.

One of the earliest recommendations on record at the Precision Tube Company is for electrical instrument pointers. Here, the requirements are extremely light weight, low mass, high strength-to-weight ratio, minimum bearing load, sufficient stiffness to withstand striking the stop pin, freedom from corrosion, freedom from warping, and low cost. This is practically a description of 3S or 52S Aluminum Alloy, and their use for instrument pointers has proved to be most reliable.

Another interesting application is for phonograph tone arms. Here, the use of 52S or 61ST Aluminum Alloy Seamless Tubing has proved to be ideal, for each fulfills the requirements of light weight, structural strength, ease in fabricating, and low cost. Components of mechanical pencils and pens are also parts for which Precision has been called upon to make suggestions. The requirements are light weight, strength, low cost, fine finish, and low scrap losses in secondary operations. In this case, Seamless Red Brass and 52S Aluminum Alloy have proved to be wise choices. Spacers and similar parts for aircraft mechanisms were once a source of trouble. They must be strong, light, dimensionally stable, and corrosion resistant. Selection of 24ST and 61ST Aluminum Alloys for this application has solved the problem.

Typical applications for brasses have been pencil barrels, radio antennas, bourdon tubing, and air restriction tubing for instruments.

Wherever possible, it has been the policy of the Precision Tube Company to recommend *two* materials. Generally the customer wishes to perform additional work such as forming, color anodizing or welding, and it is impossible to predict how each temper of every alloy will respond to the combination of steps planned. By starting with two materials, both selected to fit the end use, it is usually possible to evaluate the factors which make a particular alloy suitable or unsuitable and, thus, finally arrive at not merely a material that will suit the job, but the very best one . . . in the best metallurgical condition. By considering this as one of its greatest responsibilities, the Precision Tube Company has been able to provide hundreds of customers with the best type of tubing for their needs.

(Advertisement)

Sales of Stainless, Alloy and Tool Steels Showing Brisk Upswing

Overall Demand Seen Heavy As Delivery Dates Stretch Out On Once Easy Items

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

Pittsburgh

• • • One way of sizing up the overall steel picture is to measure demand for the handful of items that are not on a quota basis. Since pressure for allocated items is out of this world there is no way to measure it. The old yardstick of order backlogs or delivery promises on a number of specific products was smashed in the boom. Today, the number of products for which orders will be taken and delivery dates set in the old sense of the word are few indeed. Even in the limited group of products left in this category deliveries are becoming extended.

Stainless, tool and alloy steels, are the main ones in the latter class. To many observers, the extent to which delivery promises on several of these items has become extended in recent months is the surest sign that steel demand has never been more terrific since the war. These people have given up trying to gage demand for sheets, plates, pipe, structurals and bars. The latter group are all on a quota basis—mills take orders only as they need them for production planning. Piling and fabricated reinforcing bars can be included in the group of items on which deliveries are still being quoted. Not that they are easy but because of the periodic, or non-recurring nature of the jobs for which they are ordered.

Last December standard sizes and analyses of stainless steel sheets could be had in 3 to 4 weeks; some producers were even offering 10-day delivery. Today delivery promises range from 7 to 12 weeks, depending upon the producer. Stainless strip, which opened the year on a 2-month delivery basis, now runs 3 to 4 months. Special analyses of stainless sheets and strip take a good deal longer. Stainless bars are still highly competitive and easy to get promptly.

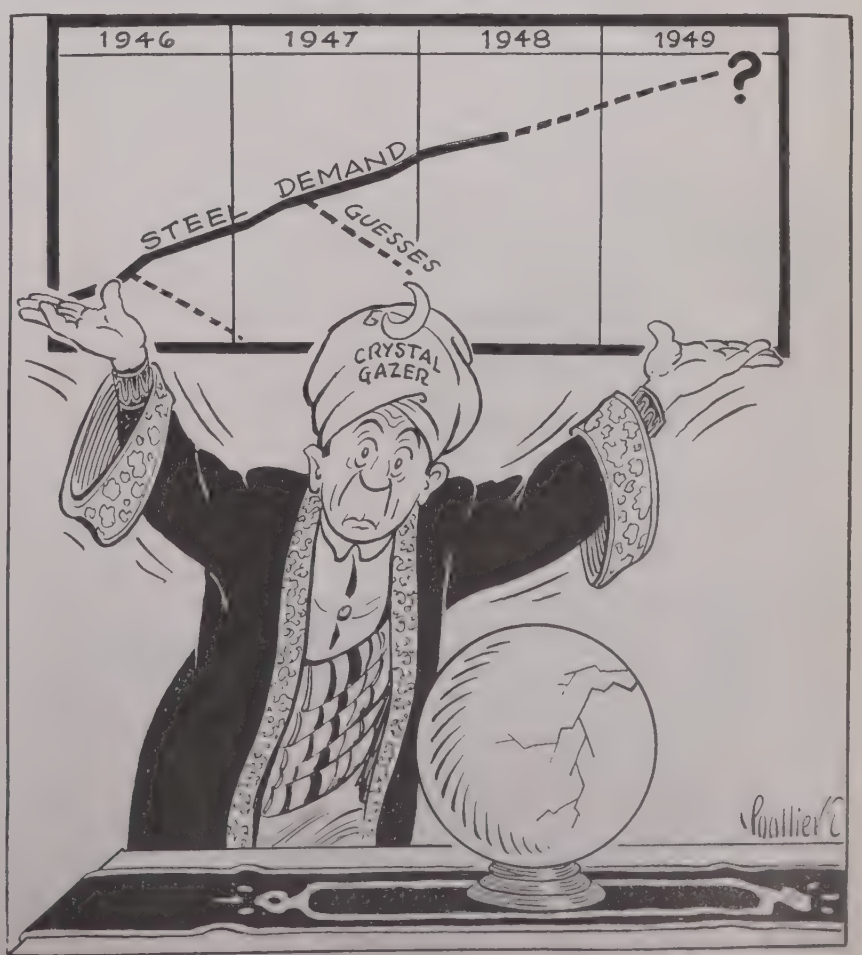
Openhearth alloys, obtainable last January in 5 to 8 weeks, are now quoted for November and December delivery. With electric furnaces pushing closer to capacity—in many plants they are going full tilt—the higher alloy steels are tighter too. At the beginning of 1948 most companies were promising their electric furncae alloys in about a month; now the figure is 2½ to 3 months. Tool steel producers are still looking for business but delivery dates in most cases are 8 to 10 weeks now where 4 to 6-week delivery was the rule at the beginning of the year.

Although piling and fabricated concrete bars are about as tight as other carbon steel items, they can be measured a little better because they are ordered for specific projects. Bearing pile delivery promises range upward from 6 months, sheet piling promises are closer to a year. Fabricated concrete bar business is booked solid through December—more orders could be taken if mills cared to open their books.

Forging business, which has been dragging along at less than 1946 and 1947 levels, shows signs of a sharp upturn in the months ahead. This is based on shipment data and forging hours worked. The latter have taken a pronounced upswing that assures heavier third quarter shipments.

Wire rope, because of its tremendous war built capacity, is still

Stumped!



about the easiest steel item to buy. Producers offer immediate shipment of many types from stock.

None of the increased business reported in the once easy lines is due either to rearmament or to the European Recovery Program. Some may be restocking, some a little advance buying, but there are no definite signs that the big push behind the new business comes from speculative or hysteria buying. There may be some: A New York textile plant operator, planning to put in some new equipment in 1949, bought $30,000 worth of stainless sheets this month. "Better than money in the bank," he said.

The brisk upswing in stainless steel orders is due to a working off of excessive inventories, according to stainless steel sales officials. Early in 1947 big customers and warehouses are said to have overbought their stainless needs by perhaps 5 or 10 pct for a period of months. When they awoke to the fact that stainless was by no means as hard to get as carbon steel they stopped buying, and the last quarter of 1947 saw a nasty recession in stainless business. Early this year small orders began trickling in; they were followed by orders from larger customers. Today stainless, while a far cry from the frenzied carbon steel business, is considered healthy though still definitely competitive.

Alloy sales officials say their increased business has not come from any particular source—that all classes of customers are stepping up order volume. Some classes are buying a little heavier than others. Large forgings and plate orders indicate that buyers of heavy chemical and process equipment have changed their minds about the future. Early this year some construction projects were deferred because of a hope in some quarters that prices would level off or dip. Many of these people have apparently changed their minds on the future trend of construction costs.

Ft. Pitt Bridge Gets Customer OK on New Pipe Forming Method

Pittsburgh

• • • **An oil company** is richer by 750 tons of oil well surface casing because a steel fabricator found a new use for a wartime forming press. Fort Pitt Bridge Works reveals that its Canonsburg, Pa., shops have produced 750 tons of 10¾-in. OD pipe with a ¼-in. wall in the past few months. Announcement of the fact and of the method of making the pipe was held up by the bridge works until the customer had reported satisfaction with the product.

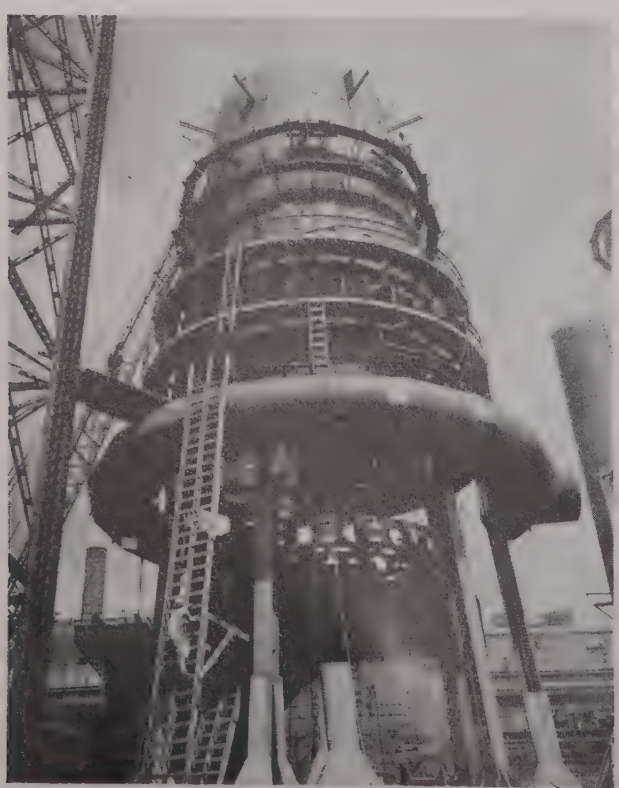
The new wrinkle in pipe fabrication is use of a 36-ft long press made of structural steel and powered by six 500-ton hydraulic jacks. It was built by Fort Pitt during the war to bend steel plate into Isherwood Sections (plate bent to increase transverse stability of oil tanker bulkheads, replacing at plate reinforced by channels).

Plate fed into the machine is now bent into pipe shape by a downward moving circular shaped die. The seal is made on an electric welding machine specially fitted for the process. Production is currently 250 ft per hr but a company spokesman said this might be stepped up by using larger pumps to speed the hydraulic jacks.

The principal limitation on output is of course the scarcity of plate. At present, plate supply to Fort Bridge as to all steel consumers is dependent on allocations from its suppliers. However, from other sources it is known that some oil companies have been able to add to their pipe quotas by conversion arrangements. Through regular pipe company sources such arrangements, with the oil company furnishing the ingots, yield pipe at about $250 per ton.

So far, Fort Pitt Bridge Works has not been offered any plate for fabrication, though it is believed that it could handle a limited amount of such business if the end product desired was surface casing. The 750 tons produced so far amount to 50,000 ft. Surface casing may go down anywhere from 50 ft to 500 ft or more, with the average per well about 400 to 500 ft. Its main purpose is to keep out surface water. This means that Fort Pitt's production, though small in the national picture, is enough to equip four wells a day.

Although surface casing is not high pressure pipe, the company has tested short sections up to 2000 psi and is also spot testing 36-ft lengths up to 600 psi. A pilot press at Fort Pitt has produced 24-in. diam pipe by the same method used on the large unit. Aside from installing faster pumps the only change planned on the present press is addition of 2 ft at either end to produce 40-ft pipe.



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MORE PIG IRON: Ford Motor Co.'s new blast furnace at the Rouge plant will double the company's output of pig iron. Work on the furnace, being done by the Arthur G. McKee Co., Cleveland, is expected to be completed sometime in October.

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Sloppy Thinking Befogs Settlement Of Foreign Scrap Controversy

Scrap Abroad Uneconomical To Move But Could Be Used In Foreign Plants

By TOM CAMPBELL
News-Markets Editor

New York

• • • **For the past** several months there has been a lot of sloppy thinking on foreign scrap. Tonnages listed as being available are only a part of the story—even if they are true. Many reports in newspapers have said (1) there are so many million tons of scrap in such and such a place (2) the American steel mills need this scrap (3) we should get the scrap at any price—and quickly.

Many American steelmakers do not want the scrap if it is uneconomical to get it over here. Most of them think that it is uneconomical to bring it here. For that reason, they are not expecting enormous tonnages mentioned.

If the scrap is brought over here at any cost and to the disadvantage of Germany or England, they reason, it means that American steelmakers will make steel from that scrap then turn around and ship it back under ERP. So let the scrap stay there and be made into steel for Europe—thus cutting down the amount of steel that must come from this country. Sounds simple but for some reason or other this point has been hard to get across say some scrap experts.

Even if it were assumed that there were 10 million tons of scrap in Germany—a lot of it buried in rubble—there is no reason why it should be shipped to this country. England needs scrap badly. But German scrap dealers do not want to sell because they have little or no use for the few pounds they receive. If they and the military government hurry to turn these pounds into dollars, that means the American taxpayer, as usual, foots the bill, say people who favor German use of scrap.

England hopes this year to make 15 million tons of steel. Because they use 60 to 65 pct scrap in their charges, close to 10 million tons of scrap will be needed. England needs this steel. She is, after all, the one country of the 16 nations for whom ERP was principally planned. If she does not make enough of her own steel she will have to get it from us. If she does not get scrap she can't make enough steel. Why not let her have as much scrap as she can get, it is argued. She can't get too much because no one wants to accept her pounds at $26 a ton at the official rate and about $15 a ton at the actual purchasing power rate.

The price of world scrap is controlled by what is paid in this country. But much of the scrap is inaccessible, scattered all over the place and is in unprepared form. By the time it was prepared for use in American furnaces it would cost too much.

What many steelmakers feel about the foreign scrap situation is this: (1) Let Germany make steel for rehabilitation with what scrap she has, (2) if there is still scrap left over let her sell it to other European nations and (3) if there is still some left let it be shipped to the United States. This is a far cry from the statements which have been made that steel leaders don't want the scrap or that they do want it.

Such a program steelmen say will (1) make more steel available at the European points where it is needed, with scrap from that location, (2) cut down some shipments of steel from this country, thus cutting down the amount of scrap which leaves this country and (3) provide a backlog of scrap for future use in rebuilding Europe. But whether the endless argument about foreign scrap will end is not certain. But let's take a look at scrap in other parts of the world.

In Japan there are about 5 million tons of carbon steel scrap in good shape and accessible. In addition to this there are about 500,000 tons of scrap—in shape of billets, blooms and slabs—which has an undetermined alloy content. The latter scrap would cost too much by the time it was spark-tested or analyzed to find out what the alloy content was. It is predicted that much of this will not be sold in this country.

As to the other 5 milloin tons of

(CONTINUED ON PAGE 122)

DOLLAR BAIT: This is a convertible Alfa Romeo, with radio (price $7000), on view at the Second International Congress of the Elegance and Comfort of the Car at Rome's Borghese Park recently. It'll go 15 miles on a gallon of gas and has top speed of 100 mph.

Industrial Briefs . . .

• NEW PIPE LINE—Texas Gas Transmission Corp., which recently acquired by merger the pipe line systems of Kentucky Natural Gas Corp. and Memphis Natural Gas Co., will soon apply to the Federal Power Commission for permission to construct and operate a new $64 million pipe line from Texas to Ohio.

• COUPLING FIRM — The newly formed Chapman Thin-Wall Coupling Corp., Buffalo, has taken over part of the idle Chapman Transmission Corp. plant and started tooling up for the manufacture of a thin-wall pipe coupling that eliminates the need for threads on the pipe.

• CHICAGO OFFICE—Turner Construction Co., New York, has announced the opening of a Chicago office at 105 W. Adams St.

• LEASES PLANT — Borg-Warner Corp. has leased plant No. 3 of the Mueller Co., Decatur, Ill., consisting of buildings totaling approximately 135,000 sq ft and 42 acres of land. The company has also taken an option on this property which will include additional land.

• WESTERN OUTLET—White Metal Mfg. Co., Hoboken, N. J., manufacturer of collapsible tubes and metal can spouts, has appointed H. J. Fouts & Co., 6253 Hollywood Blvd., Los Angeles, its exclusive representative for the state of California.

• TO HEAD GROUP—James M. Todd, New Orleans consulting engineer, has been nominated as the next president of the American Society of Mechanical Engineers. Mr. Todd will succeed E. G. Bailey of New York.

• MOVES—Jeffreys Engineering & Equipment Co., a sales and engineering organization of metalworking equipment and machine tools, has moved their offices to the Guilford Bldg., Greensboro, N. C.

• CENTENNIAL — Watson-Stillman Co., Roselle, N. J., manufacturers of hydraulic equipment, has recently celebrated its one hundredth anniversary.

• CONSTRUCTION BIDS — The Bethlehem Steel Corp.'s shipyard at Quincy, Mass., has submitted the lowest bids for two passenger-cargo vessels to be built for American Export Lines. If the contract is awarded for both, the cost would be $26,113,300.

• AFA OFFICERS—Dr. James T. MacKenzie, technical director, American Cast Iron Pipe Co., has been elected chairman of the Birmingham chapter, American Foundrymen's Assn. C. D. Caldwell, president of the Caldwell Foundry & Machine Co., was elected vice-chairman.

• ACQUISITION—The Wiesner-Rapp Co., Inc., Buffalo, metal welding and fabricating concern, has acquired the Farnham Mfg. Co. for an undisclosed sum and will operate it as the Farnham Mfg. Div.

• COST MANUAL — A cost manual for foundry clerical personnel has been published by the Gray Iron Founders' Society. The manual lists more than 200 items of foundry cost, followed by the department and title of the account to which the item should be charged. Copies are available at GIFS headquarters, Public Square Bldg., Cleveland at $1 each.

• CONSOLIDATION—The Arcos Corp. has moved its general offices to 50th & Paschall Ave., Philadelphia, thereby bringing all their activities together at one address.

• REELECTS OFFICIAL — Charles R. Collins, vice-president in charge of sales and advertising of the Gerotor May Corp., Baltimore, has been reelected vice-president of the Oil Heat Institute of America.

Foreign Scrap

(CONTINUED FROM PAGE 121)

carbon scrap no more than about 1½ million tons will ever reach this country. Why? Because General MacArthur is determined that he will do in Japan what has not as yet been done in Europe—protect the home industry against the day of resumed operations.

It is expected that 3½ million tons of scrap in Japan will be held in that country to help the reestablishment of industry. It is doubtful if any of that tonnage will reach this country. Why should it, say people there? If it does come here it means less steel on the spot and more to come from the United States—presumably made from the scrap that was hauled from Japan to this country—and was originally shipped from this country.

The scrap in the Philippines is estimated at about 250,000 to 400,000 tons but is scattered all over hell's half acre and Davy Jones' Locker. Experts who have been there say that it is uneconomical to gather. They say it will never be economically assembled in shape to be used in this country.

In the Mediterranean area there is "a lot of scrap" but it is likewise scattered so far and wide from Casablanca to Tobruk and farther —so that it cannot be picked up at a price which would suit buyers either here or in Europe. These are rough facts. But men who have expended money and time to look into the scrap situation abroad have been there and know that such scrap tonnages are no more than an economic mirage.

That scrap may also be hard to get because the men who hold it want more than pounds or dollars is important. Any scrap purchased in Germany means little to the men who own or prepare it. Ninety pct of the purchase price must go for occupation expenses. This leaves 10 pct for the men collecting the scrap or owning it. That is not enough in pounds or dollars or any other currency. Why not let Germany use the scrap it needs, the rest of the European countries the balance—and if some is left ship it to the U. S.?—that's the latest argument —but probably not the last.

FTC Appraising Cease And Desist Order Aimed At Steel Selling

Does Not Specifically Outlaw Multiple Basing Point Way Of Selling Products

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By GENE HARDY
Washington Editor

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Washington

• • • **A cease and desist** order aganist the steel industry, now being appraised at the Federal Trade Commission, calls upon the steel industry to (1) establish a plant price at every mill; (2) sell f.o.b. mill when requested; and, (3) cease the compilation and dissemination of freight rate information, THE IRON AGE learned this week.

The order, prepared by Lynn C. Paulson, chief trial counsel in the current price-fixing charge against the steel industry, is not expected to be changed except for minor details, even though it may not be issued until some time in early 1949.

After 6 months of intensive hearings, Mr. Paulson has prepared an order calling on the industry and the American Iron & Steel Institute to "cease and desist from using or engaging in any of the following methods, acts, practices, or things pursuant to or as part of a planned common course of action, combination or conspiracy through the American Iron & Steel Institute or otherwise:

"(1) Composing, establishing or announcing prices by using any other point than the point of production or shipment as a base, basing point, price base, or starting point; in other words refraining from having a plant price at every mill.

(2) Refraining from having and quoting and using a price for any given product at the point of production for such product and offering to sell at that price the goods produced at that production point if said goods are offered for sale or sold anywhere in intra or interstate commerce; in other words, refraining from selling f.o.b. mill when requested.

(3) Contributing to the compilation of or using in connection with naming, making or selling at a delivered price the compilations or lists of freight rates, or freight rate factors described in the findings supporting this order or any similar compilation or list; and, from using in connection with the naming, establishing or use of sale and delivered prices, any such compilation or list compiled or established by any competing company."

As forecast by THE IRON AGE last winter (Feb. 26, p. 104) the above points comprise the major portion of the FTC case against the steel industry. According to Mr. Paulson, the order as quoted above will probably stand with the exception of a possible addition of a section relating to the alleged standardization of extras.

While the order as now written does not outlaw the multiple basing point system in exactly that language, Mr. Paulson believes that the basing point system as practiced by the steel industry will be done away with since it will be impossible for the industry to sell partly on an f.o.b. mill basis and partly on a basing point basis and still maintain an effective delivered price system.

Mr. Paulson further points out that the immediate effect of such an order would be to benefit steel consumers now being cut off from steel supplies due to the reluctance of steel producers to absorb increased freight costs. It is claimed that these consumers would be able to buy f.o.b. mill at any point, provided they were willing to pay the freight.

Another effect, according to the FTC attorney, would be to increase the use of trucks and barges as a means of transporting steel. He also expects the order to result in more independent action on the part of steel producers, more competition, particularly on sealed bid contracts, and, as a direct result of this competition, eventual lower prices. In addition, stimulation of fabrication in transit is also predicted.

While the language of the order is reasonably firm in Mr. Paulson's mind, it may be many months before it is finally issued, even if the commission approves it within a relatively short time.

As the case now stands, Mr. Paulson expects to wind up his formal presentation within the next few weeks. The trial examiner will then grant attorneys for the industry adequate time, probably about 6 weeks, in which to make any motions they desire to present for consideration. Then, about 10 days will be given up to acting on these motions. Defense counsel will then be given time to present their defense, which will probably begin about Oct. 1.

Therefore, it can be readily seen that there is little likelihood of the order being issued until some time after the first of next year. After the order has been served the court battle will begin and it is anybody's guess as to the length of time required before the case reaches the Supreme Court.

CEASE AND DESIST

New York

• • • This summarizes the meat of the cease and desist order expected to be issued by the Federal Trade Commission on the steel industry late this year or early next year. There may be some changes but they probably will be minor.

This information is in line with The Iron Age policy of bringing to its readers interpretive articles on major trends as soon as possible.

Other news on the steel basing point controversy will be found in The Iron Age May 6, pp. 121, 123 and 124. Also see p. 116, June 3 issue for the industry's reaction to possible moderation in FTC actions in demanding changes in steel selling methods.

The industry viewpoint this week still is that legislation is the only answer to what steel leaders believe will be "chaos and anarchy" in selling. Time will tell.—Editor

OIC Appoints Consultant

Washington

• • • **Marshall A. Shapiro** has been appointed consultant to the Iron and Steel Negotiating Div., Office of Industry Cooperation, Dept. of Commerce.

Mr. Shapiro will be associated with Alex Miller, Chief OIC scrap consultant.

Production of Steel Prefab Houses Will Begin During June

Washington

• • • **Production of** porcelain enameled steel prefabricated houses will begin late this month at its Columbus plant, spokesmen for the Lustron Corp. said here last week.

"Present plans call for shipments at the rate of 2000 per month before the end of the year," they said. "In 1949, we expect to deliver more than 40,000 complete homes."

Admittedly, production goals will depend to a great extent upon available supplies of steel. The only non-steel items in the five-room Lustron house are the concrete floor slab, the asphalt tile finish, and the aluminum windows.

Weight of the house, set in place, is estimated at 10 tons. Up to 20,000 tons of steel monthly would be required to meet 1948 production goals while plans for 1949 output require from 375,000 to 400,000 tons for the year.

Whether makers of prefab housing will be successful in their efforts toward inclusion in the voluntary steel allocation program remains a question. Including Lustron, at least five producers are affected by the problem.

Old Chester Furnace Is Sold To Engineer Group

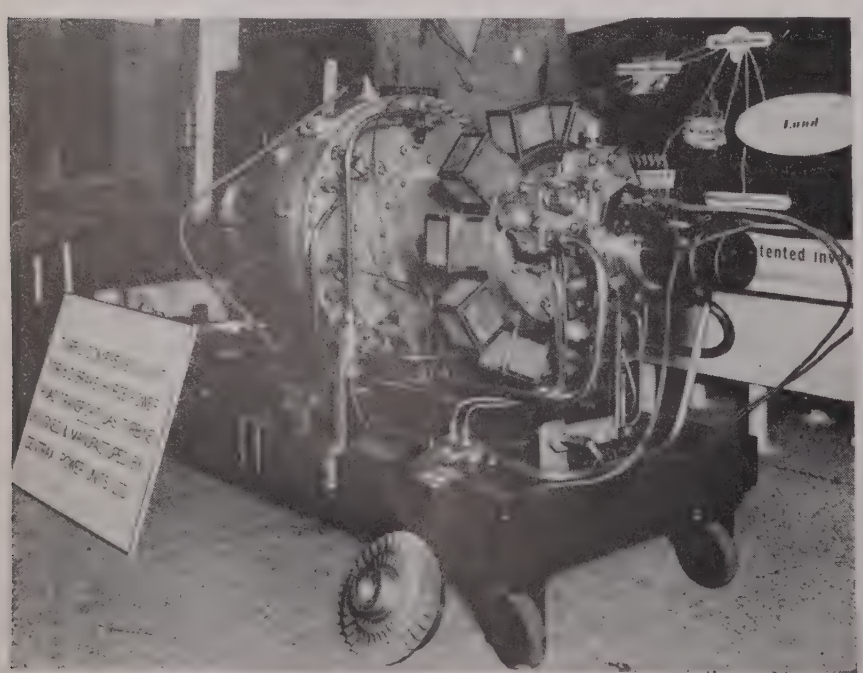
Philadelphia

• • • **The old Chester, Pa.** blast furnace operated during the war as the Pittsburgh Ferromanganese Co. has been sold by the War Assets Administration to H. A. Brassert & Co., New York, acting for the Brown Engineering Corp., Houston, Tex. The purchase price was $300,000, on which a deposit of $100,000 has already been made.

The purchase price includes land, buildings and equipment, minus equipment already removed including pig machine, boiler and turbo blowers. Brassert & Co. has a contract to rehabilitate the furnace and put it into operation. A source of supply for coke has been arranged, according to a reliable source.

Foreign ore will probably be used, although there has been no final determination on this. The furnace is expected to get into early production using the old upright blowers, but it will be used for producing only basic iron. A previously announced sale to Atlas Steels, Inc., Wilmington, Del fell through because of withdrawal of financial support.

GAS TURBINE FOR CARS: This is claimed to be the world's first gas turbine engine for use in trucks and large cars. It is being built in Britain by the government-owned Power Jets (Research & Development) Ltd. The unit weighs 230 lb, will run on any kind of fuel, and develops about 160 brake horse power.



C. M. White Republic Head Reaffirms His High Price Position

Cleveland

• • • **C. M. White, President,** Republic Steel Corp., this week reaffirmed his position on steel prices in a statement to THE IRON AGE. Said Mr. White: "It has been my firm conviction for some time that steel prices are not high enough to assure the industry of a firm financial foundation in the months and years to come—unless some material reduction in our present costs comes about.

"In the last several months our costs have continued to rise and nowhere do we see any item tending toward a downward cost trend.

"Costs of some raw materials required by Republic have gone as high as 400 pct over 1936-1939. The American Iron & Steel Institute in a recent analysis estimated fuel oil at 175 pct above this base period, heavy melting scrap at 163 pct, purchased coal at 129 pct, ferromanganese at 64 pct, palm oil at 461 pct, and zinc at 117 pct above this period. From our own experience, I would say that these figures are conservative estimates of the increase in costs of these raw materials. Most construction costs are now well over 200 pct higher than in 1936-1939 and freight rates are now between 125 and 165 pct higher. Steel wages, of course, have more than doubled in this period.

"I wish to reaffirm that I believe that the present profit margin at which the steel industry operates is too low to encourage the new capital which is going to be needed to finance the improvements and replacements which must be made if we are to maintain or increase our capacity. The price of steel is too low to enable us to build up capital reserves to supplement our regular allowed depreciation to provide for replacing our plants and equipment as they wear out. It must still be remembered that in spite of the tremendously increased construction, raw material and labor costs experienced by the steel industry since 1939, the selling price of steel as shown by THE IRON AGE composite index has increased only 40.3 pct in this same period, as compared to an increase in prices of all other commodities of 70.2 pct, according to the consumers price index."

Weekly Gallup Polls . . .

Voters Give Opinion on Several Bills Before Congress

Princeton, N. J.

• • • **Voter opinion** favors seven out of the ten major bills now being considered by Congress, according to George Gallup, director, American Institute of Public Opinion.

Republican leaders in the House and Senate, in order to speed up legislative machinery during closing days of the 80th Congress, have set up a goal of must legislation. The proposals given top priority are the draft, renewal of reciprocal trade agreements and displaced persons bills.

Other important measures pressing for passage, but which will have to take their chance in between appropriation bills, include United Nations charter revision, federal aid to education, civil rights, repeal of margarine taxes, and long term housing and farm programs.

In recent weeks the institute has tested public sentiment on all these issues except for the displaced persons and housing and farm legislation. A summary of the most recent polls on the other issues follows:

Draft—While 70 pct of voters think Congress ought to pass a draft law, when it comes down to a choice between Universal Military Training and the draft, twice as many would choose UMT as the way to build up our armed froces. If a draft has to come into being, the public believes 18 months, rather than the 2 years being discussed by Congress, should be the limit on the service term.

Reciprocal Trade Agreements—Informed voters overwhelmingly want Congress to renew the Trade Agreements Act which empowers the President to arrange reciprocal trade agreements with individual countries. Among people familiar with the subject the vote is better than eight to one for extending the program.

Civil Rights—It is unlikely that President Truman's civil rights program as a whole will be considered unless it is tacked onto another bill, as Senator Langer, N. D., threatens to do in connection with the draft. Outside the South the weight of voter opinion favors the program, but Southern voters oppose it in the ratio of nine to one.

U. N. Charter Revision—Voters agree in general with congressional efforts to set up a policy for the United States to follow in trying to make the United Nations more effective. The public would favor almost any plan to speed things up. Voters particularly want a limit put on the use of the veto. Sixty-five percent would approve a mutual defense alliance with Western European countries under the U. N. charter, which is another policy Congress is considering.

Federal Aid to Education—A majority of American voters believe the federal government should help states finance their school systems. Already passed by the Senate, the Taft bill would distribute about $300 million annually to the states in school aid. Fifty-one percent of voters approve this step, but one in three thinks that the cost of education should be borne entirely by individual states.

Margarine Tax Repeal—Seven out of ten voters want all federal taxes and fees on margarine repealed as would be done under a bill passed by the House and waiting Senate action.

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• • • **To what exent** will the Taft-Hartley Act play a part in the 1948 presidential campaign?

A year ago it looked like a number one campaign issue, as labor leaders vowed revenge on congressmen and senators who had voted for the bill. Unions maintained that it went too far in regulating organized labor, and surveys of the general public found that a considerable proportion of voters also felt at the time that the legislation was too severe.

Today the country's attitude toward the whole field of labor legislation shapes up as follows in a coast-to-coast poll by the institute.

Unions Call Present Labor Laws Severe; General Public Is For Stricter Legislation

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(1) The weight of opinion among members of labor unions is that the laws regulating organized labor are too strict. Poll reporters for the institute found sentiment in favor of revising the Taft-Hartley law to restore rights curbed by legislation and in general to give unions more power.

(2) Among the general public, however, the weight of sentiment is that existing labor laws are not strict enough. A larger number want to see the Taft-Hartley act revised to tighten it up and put more teeth in it, than want to see it changed to relax control over unions. However, the side in favor of tighter control has only a comparatively small numerical advantage in the tug of war against those who would relax control.

Action in Congress indicates that the issue of revising the Act in the current session will be side-stepped. The joint congressional labor-management committee decided not to propose any changes this year.

The poll was confined to voters who have heard or read about the Taft-Hartley Act—a total of seven out of every ten (72 pct).

They were asked:

"Do you think the Taft-Hartley Law should be revised, repealed or left unchanged?"

The same question has been asked in previous surveys and the trend follows:

	Aug. '47 Pct	Oct. '47 Pct	Today Pct
Revised	32	27	34
Repealed	21	18	15
	53	45	49
Left unchanged	22	28	24
No opinion	25	27	27

Mechanization Helps Make Low Grade Copper Mine Prosperous Venture

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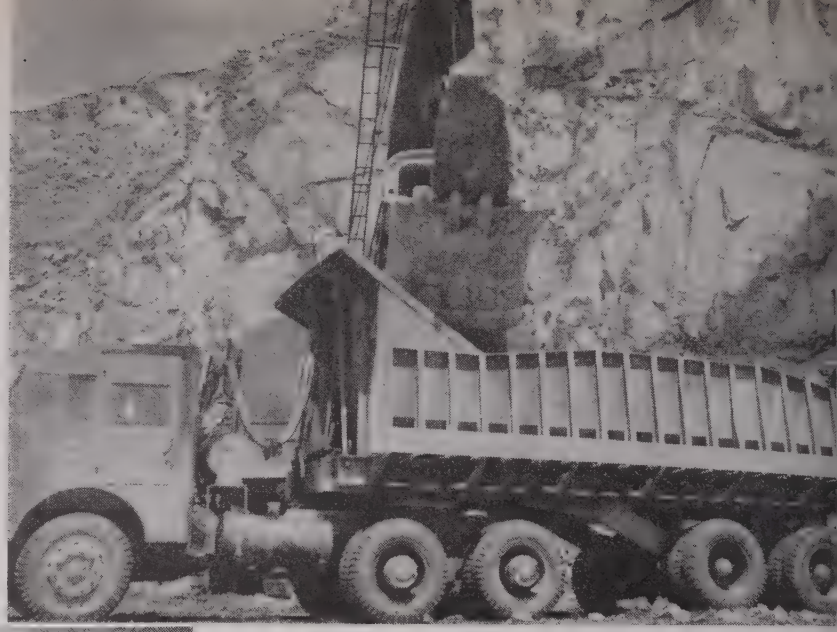
Mt. Lyell Co. Successfully Operating One of Lowest Grade Deposits In the World Now Being Worked . . . Queenstown, Tasmania, Is Site of Operations.

o o o



ABOVE: Ore in open-cut workings is practically untouched except by powerful machines. Here, an electric shovel loads a 20-ton truck. Capacity of the shovel is about 3 tons of ore.

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LEFT: Ore from the open-cut workings is tipped into the transfer pass and gravitates to a tunnel 700 ft lower. This is the main traffic artery taking ore to the treatment plant.

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BELOW: Iron pyrites, one of Mt. Lyell's by-products, are being sent to the company's port, Regatta Point, in wooden tubs for shipment.

ABOVE: This is a section of the surface works. Last year's output was: Blister copper, 8273 tons (ore averaged only 0.686 pct); pyritic concentrate, 51,500 tons; silver, 30,313 oz.; gold, 5710 oz.; copper sulphate, 300 tons.

Court Hands Industry Decision in Second Bout With Gray Market

Declares Courts Should Help Industry Protect Name And Reputation

By WALTER G. PATTON
Detroit Regional Editor

Detroit

• • • **The steel gray market** had its wings clipped the second time on June 4 when Judge Frank Fitz-Gerald of Wayne County Circuit Court issued a temporary injunction restraining Harry C. Edwards of Detroit from using the name of Jones & Laughlin Steel Corp. in future steel deals.

However, after listening to the testimony of three auto steel buyers, J & L's Detroit district manager and two business associates of Mr. Edwards, the Judge and the spectators at the hearing were probably as much in the dark as ever as to what makes the steel gray market tick.

Left unanswered after the hearing, were the important questions of how Mr. Edwards planned to use the orders made out to J & L he was to get from Ford Motor Co., why he allegedly elected to represent the ingots as coming from J & L whose officials testified the company had not sold ingots since 1943 and why an associate of Mr. Edwards was willing to offer to sell to Briggs Mfg. Co. 7500 tons of ingots per month from an admittedly unknown mill at a commission rate that had not even been discussed.

A temporary restraining order was issued May 18 in the U. S. Federal Court of Chicago, against Howard Kimble, a business associate of Mr. Edwards. No date has been set for the hearing on the merits of the Detroit case. A damage suit against Mr. Kimble will be reopened in Chicago on Sept. 20 (IRON AGE, May 27, p. 120).

Herbert Johnson

Testifying for the plaintiff at the Detroit hearing were Hubert L. Sharer, steel buyer for the Briggs Mfg. Co., Lawrence Trefry, steel buyer for Ford Motor Co., Harold E. Joy, assistant purchasing agent, Ford Motor Co., Charles Merritt, Detroit district manager for J & L, and Herbert Johnson, assistant to the vice-president in charge of sales, J & L Steel Corp.

Appearing for the defendant were his son, Harry C. Edwards, Jr., of Detroit and Frank J. Burrows, Detroit representative for Universal Castings Co., Chicago and Mohawk Casting Mfg. Co., Cleveland.

The defendant, Mr. Edwards, did not take the stand on his own behalf.

In Mr. Sharer's testimony it was stated that Mr. Edwards represented he could obtain a "substantial quantity" of steel ingots from J & L which he would sell to Briggs at a price of $79 per ton if Briggs would sign an order made out to J & L. The order was to be delivered to Mr. Edwards rather than the steel company. Harry C. Edwards, Jr. and Mr. Burrows, testifying for the defendant, denied that the J & L name had been used during the conversation with Briggs.

On the witness stand Mr. Burrows admitted he had solicited an order for 7500 tons of steel worth approximately $500,000 at Briggs without knowing the name of the mill that would furnish the steel. He also testified no commission was received from the proposed sale and that there had been no understanding with Mr. Edwards as the amount of commission he would receive.

During cross examination both Mr. Trefry and Mr. Joy said that the diversion of large tonnages of steel into brokers' hands during the present steel shortage, if proved, would damage J & L's reputation with steel purchasers and have a definite bearing on their future steel buying policies.

Mr. Johnson's testimony brought out he had personally investigated more than 50 cases of alleged diversion of J & L steel and that the company had publicly pledged itself to keep its products out of gray market channels. Every effort was

Coming Events

June 21-25 American Society for Testing Materials, annual meeting, Detroit.

June 28-July 1 American Electroplaters' Society, Convention and Industrial Finishing Exposition. Atlantic City.

June 30-July 2 Machinery Dealers National Assn., convention, French Lick Springs, Ind.

July 16-24 American Road Builders' Assn., convention and Road Show, Soldier Field, Chicago.

July 26-27 Institute of Scrap Iron & Steel, midyear meeting, Atlantic City.

Aug. 30-Sept. 3 American Chemical Society, national meeting, Washington.

Sept. 6-10 American Chemical Society, national meeting, St. Louis.

Sept. 13-17 American Chemical Society, national meeting, Portland, Ore.

Sept. 13-17 Instrument Society of America, conference and exhibit, Philadelphia.

being made, he said, to direct steel into regular trade channels.

Mr. Johnson also testified that the order Mr. Edwards had requested called for the payment of $42.50 on the original order. The differential between this and $75 would have been paid through bank sources not mentioned in the hearing.

According to Mr. Johnson, J & L has not offered steel ingots for sale to customers since July 1943. In his testimony Mr. Johnson said the company has established to its own satisfaction that there has been no connection between any of its officials and the sale of steel on the gray market.

In granting the injunction, Judge FitzGerald agreed that it was proper for J & L to take steps to protect its good name in what he described as "an age of industrial immorality." The court should step in to help concerns attempting to protect their reputation and their good name, the judge said, in handing down the injunction.

Construction Steel . . .

• • • **Febricated steel awards** this week included the following:

700 **Tons,** Edgewater, N. J., plant for Lever Bros. to American Bridge Co., Pittsburgh, through Stone & Webster Engineering Corp., Boston.
370 **Tons,** Los Angeles, overcrossing and undercrossing, Hollywood Parkway at Bonnie Brae and Beaudry, through Haddock Co. to Blue Diamond Corp.
325 **Tons,** Buffalo, Jewish Center, to Bethlehem Steel Co., Bethlehem, by Shirley Herman Co., general contractor.
220 **Tons,** Chestnut Hill, Philadelphia, Presbyterian Church, to Norris Iron & Wire Works.
150 **Tons,** Philadelphia, modernization of railway terminal, Reading Co., George A. Fuller Co., Philadelphia, contractor, to Bethlehem Steel Co., Bethlehem.
110 **Tons,** Rockville Centre, N. Y., community center to Grand Iron Works, Inc., New York.
105 **Tons,** Petaluma, Calif., bridge across Petaluma Creek, through Healey-Tibbitts Construction Co. to Bethlehem Pacific Coast Steel Corp., San Francisco.
100 **Tons,** Rutland, Vt., bridge to Vermont Structural Co.
100 **Tons,** Birmingham, annex for Loveman, Joseph & Loeb Department Store, to Ingalls Iron Works Co., Birmingham.

• • • **Fabricated steel inquiries** this week included the following:

5300 **Tons,** Brooklyn, bus depot for City of New York.
2200 **Tons,** Philadelphia, neurological unit for the Philadelphia General Hospital, McCloskey Co., low bidder.
1960 **Tons,** Portland, Ore., bridges on Seward-Anchorage highway, Chugach National Forest, Alaska, Division Engineer, Public Roads Administration, Portland, June 29.
1870 **Tons,** Portland, Ore., Public Roads Administration, Portland, June 29.
475 **Tons,** Newfane, N. Y., Central School, John W. Cowper Co., Buffalo, low bidder.
220 **Tons,** Cook County, Ill., bridge section 0707-1HF State Highway Dept., Bethlehem Steel Co., low bidder.
200 **Tons,** Cook County, Ill., State Highway Bridge 0606-2HF State Highway Dept., Bethlehem Steel Co., low bidder.
200 **Tons,** Whiting, Ind., power house addition for Standard Oil Co. of Ind.
200 **Tons,** Laurel, Md., bridge, Maryland State Roads Commission, June 22.
185 **Tons,** Riverton, Wyo., tunnel and structures, Bureau of Reclamation, Riverton, Spec. 2269, July 7.
150 **Tons,** Woodford County, Ill., state highway bridge section 32RF, State Highway Dept., Bethlehem Steel Co., low bidder.
150 **Tons,** Rochester, N. Y., bridge, Lehigh Valley R.R., June 21.
125 **Tons,** North Adams, Mass., Beaver St., bridges and approaches. W. W. Wyman Inc., Shelburne Falls, Mass., low bidder.

• • • **Reinforcing bar awards** this week included the following:

2300 **Tons,** Glendale, Calif., reinforced concrete reservoir, through E. C. Nickel, Arcadia, to Blue Diamond Corp.
600 **Tons,** Skokie, Ill., laboratory for Portland Cement Assn., Turner Construction Co., New York.
540 **Tons,** Philadelphia, superstructure for neurological hospital, Philadelphia General Hospital, to McCloskey & Co., Philadelphia.
325 **Tons,** Philadelphia, Asten Hill Mfg. Co., to Mahoney-Troast Co., New York.
250 **Tons,** Chicago, building for Goodman Mfg. Co. to Sumner Sollitt Co.
250 **Tons,** Peoria, Ill., addition to brewery for Pabst Brewing Co. to Stone & Webster Engineering Corp., Boston.
200 **Tons,** Newfane, N. Y., Central School, John W. Cowper Co., Buffalo, low bidder.
190 **Tons,** Delaware County, Pa., Pennsylvania Dept. of Highways, state route 180 and 131, to Nellolteer, Durham, N.C.
150 **Tons,** Des Moines, office building for State of Iowa, previously reported as 1000 tons. Type of floor construction changed to decrease tonnage of bars needed. Award made to Johnson, Drake & Piper, Minneapolis, and Kurcharo Construction Co., Des Moines.
145 **Tons,** Schuylkill County, Pa., Pennsylvania Dept. of Highways, route 464, section 2, to Troy & Beaver Contracting Co., Pittsburgh.

• • • **Reinforcing bar inquiries** this week included the following:

815 **Tons,** Portland, Ore., construction on Seward-Anchorage highway, Chugach National Forest, Alaska, Division Engineer, Public Roads Administration, Portland, June 29.
365 **Tons,** Riverton, Wyo., tunnel and structures, Bureau of Reclamation, Riverton, Spec. 2269, July 7.
275 **Tons,** Portland, Ore., Public Roads Administration, Portland, bids to June 29.
160 **Tons,** Whiting, Ind., school building for St. John the Baptist.
100 **Tons,** Paulsboro, N. J., Socony Vacuum Oil Co., Chas. H. Schwertes, low bidder.

FARM TRUCKS: These are part of the 750 5-ton Bedford trucks which Britain is shipping to East Africa for use on the 3¼ million acre groundnut farm now being developed there. The $200 million, government financed project is aimed at relieving Britain's shortage of margarine and cooking fat.

Export Appeals Board Set For Hardship Cases

Washington

• • • **The Office of** International Trade has decided to set up an Appeals Board on Export Controls. The board will begin functioning June 15 to provide a "simple and efficient appeals procedure," according to OIT.

Harrison Lillibridge, New York City lawyer, has been named chairman of the newly created board. He held a similar position in the WPB during the war.

OIT declared that the new board was necessary because of "the growing importance of export controls" and the demand for an appeals procedure. The board will draw its personnel from the present OIT staff and will operate in Washington.

Under the new setup, any exporter may appeal who feels that a regulation or administrative action of OIT works an exceptional or unreasonable hardship on him.

Extends Tin Control And Other Essentials To June 30, 1949

Washington

• • • **Tin controls,** estimated by Congress to hold domestic consumption and stockpiling to about 91,000 tons this year, now will remain until June 30, 1949, as a result of legislative extension.

The House, which earlier had agreed to extend controls over tin and other scarce materials until Feb. 28, finally agreed to the June 30 extension date set by the Senate.

In addition to extension of controls over critical materials, the new law extends the authority of the Office of Defense Transportation to the same date. Previously, these powers were scheduled to expire on Feb. 28.

Specifically, the new law extends control powers over the following materials: Tin and its products, antimony, cinchona bark and quinidine, and fats and oils. Authority to grant priorities for export also is included in the extension.

Seantor Flanders, R., Vt., told the Senate that while exact estimates of U. S. demands for tin in 1948 vary, the federal government estimates that industrial demands now may be held to about 88,000 tons, leaving a balance of 3000 tons for stockpiling. He said that if controls had been extended, consumption probably would rise to about 113,000 tons.

"This estimate is based upon the information received from industry as to their probable requirements, upon requests for allocations under existing regulations, and upon modifications of prewar consumption by industries which now are not permitted to use tin," he stated. "The government estimate seems consistent with the prevailing feeling in industry."

Secretary of Commerce Sawyer, in testimony before the House Banking Committee, stated that the estimates of the International Tin Study Group (a UN affiliate) show that world production has not been keeping pace with the advance estimates made last October. "As a result," he said, "balance between supply and industrial requirements will not be attained until mid-1950."

With respect to antimony, Mr. Sawyer said that world production in 1947 was probably not more than 30,000 tons, and shipments from China out of new production were not more than a fraction of their prewar level. "Industrial demand has increased, thereby accentuating the critical outlook," Mr. Sawyer stated. "Furthermore, the demand for strategic stockpile requirements will delay the attainment of a balance."

Increases Prices Of Tractors 2½ to 14.8 Pct As Costs Go Up

Chicago

• • • **The upward adjustment** of prices by International Harvester Co. effective June 3 on its wheel type farm tractors range from 2½ pct to a top of 14.8 pct. The company has stated that "the increase was made necessary by the constantly rising cost of materials and other factors in production." J. L. McCaffrey, president of International Harvester Co., when asked by THE IRON AGE if steel was involved in the constant rising cost of materials replied yes.

Mr. McCaffrey told THE IRON AGE "that in order to maintain production they are buying considerable tonnages of premium priced steel which is obtained through conversion channels." During the first quarter of this year the International Harvester Co. paid $850,000 in premiums for conversion steel that was converted into sheets for their use, Mr. McCaffrey said. He estimated that this premium averaged about $61 a ton on sheets alone.

International Harvester's official release explained that the increase was necessary because their margin of profit on the entire farm tractor line has declined below minimum levels and they were actually in the red on several models.

50 YEARS AGO

THE IRON AGE, *June 16, 1898*

• "France and Germany both claim to have been the producers of the first steel castings. France certainly made the first marketable openhearth steel castings as early as 1870. About the year 1861, steel castings were made by the crucible process by Vickers at Sheffield, England, under Reippe's patent. In the U. S. prior to 1870 a number of steel works made a few castings but they were intended for their own use and little thought was given to quality."

• **"It is only recently that the liquification of gases has advanced beyond laboratory experiments. While liquified air can now be produced in what may be termed 'commercial' quantities with the aid of comparatively simple apparatus, it is as yet too early to predict the employment to which it may be advantageously put."**

• "The U. S. Naval authorities have been severely arraigned by those who would padlock the government pocketbook, or else make it with only an inlet passage. Every report of target practice by the fleet has been followed by wild ravings about the wicked waste of money."

• **"The third annual convention of the American Foundrymen's Assn. held in Cincinnati last week surpassed last year's gathering at Detroit and was especially enjoyable to the members of the association by reason of the open-handed hospitality of the local foundrymen."**

• "Trade reports of the iron and steel industry must necessarily be monotonous these days. It is doubtful if ever there was a period of 5 or 6 months when these was so little variation of prices as there has been since the advent of 1898."

• **"The question of electrolytically depositing metals on aluminum has been practically solved by the Pittsburgh Reduction Co. and in a short time the company expects to do this class of work commercially."**

MACHINE TOOLS

. . . News and Market Activities

Military Preparedness Program Expected to Accelerate New Orders

• • • **Little change in** tempo was evident in major segments of the machine tool industry this week despite the military preparedness program, generally held to be a bonanza for most machine tool builders, but from which thus far inquiries have been numerous but firm orders few.

Some acceleration in the flow of new firm orders is imminent, however, with some of the biggest prime and subcontractors in the aircraft business preparing to increase production tremendously. Plants which have been practically idle since V-J Day are being reopened, like the Lockland, Ohio, plant of Wright Aeronuatical Corp. in which General Electric Co., according to reports, is going to make jet engines. Pratt & Whitney. it is rumored, will reopen the Kansas City, Mo., plant.

Other signs of the times are the efforts of jet engine component producers to increase production and it is from this source that much of the machine tool business is stemming at the present time.

In Cleveland it was reported this week that General Motors Corp. is giving the go sign on machine tool shipments for the new Chevrolet plant.

Newspaper and textile journal representatives got a look at the Warner & Swasey Sulzer weaving machine last week, which, according to reports, produces cloth at more than twice the speed of the conventional loom. The Sulzer is a Swiss machine which Warner & Swasey redesigned. It will be on the market possibly by the end of the year.

Company officials were cautious in their predictions, but hope to produce about 3000 of the Sulzer machines a year, it was reported. The price is likely to be three or four times that of a conventional loom, which sells for $1000 or more.

Rudolf Roseman of Munich, Germany, invented the Sulzer loom 20 years ago and sold the patent to Sulzer Bros., Winterthur, Switzerland. The machine is yet to reach the European market. Warner & Swasey has redesigned it for U. S. use and has built five.

The Sulzer's shuttle weighs 1 oz compared with the ordinary wooden shuttle with bobbin weighing 1½ lb. The Sulzer shuttle is thrown across the warp, dragging its yarn after it, drawing it off a cone or "package," instead of letting it out of a bobbin. When the shuttle reaches the other side of the warp, the thread is cut and the shuttle drops down and returns on a small conveyer, instead of being kicked back again as the wooden shuttle is. This is accomplished by designing the metal shuttle so that it picks up and grasps the thread at its starting point with great rapidity. Certain operations, such as bobbin winding and cleaning, are eliminated. Extreme uniformity is achieved in the cloth.

Aircraft Industry Planning To Open Idle Plants To Increase Output

In Detroit, a recent survey shows that many segments of the machine tool industry are comparatively quiet. Large tooling programs for the Big Three, it is indicated, are practically completed and the amount of product improvement equipment being ordered is small. Builders of special machine tools, in particular, are experiencing a lull at the moment and so are many distributors of standard equipment. An exception appears to be the builders of certain types of automatic lathes which continue to be in heavy demand.

Requests for machine tool quotations continue to come in, however, despite the absence of new placements. New orders for equipment at Reo have been placed, it is reported. Ford is planning some substantial changes in its tool room, it is learned. A project for Chrysler's Lynch Road plant is also being given consideration.

Reports heard here this week that the U. S. Army plans to order a substantial quantity of vehicles has raised some hopes that new tools will be required in quantity to carry out the program. The present indications, however, are that tooling commitments in the Detroit area for rearmament, if any, are being kept closely under cover.

In Albany, Simons Machine Tool Corp., which produces fasteners for refrigerators, shelves and kitchen cabinets, has started construction of a $60,000 one-story steel factory at its plant in Menands to house expanded output. According to Samuel Koffsky, chief engineer of Simmons Machine Tool, the 16,000 sq ft structure is expected to be completed by the end of June.

ERP Earmarks 16,000 Tractors For France

Chicago

• • • **The 16,000** tractors earmarked for France on the ERP program covers a 15 month period. The initial request for the entire ERP tractor program was 67,000 units plus about 2000 crawler type tractors to be used to lay railroad tracks. The industry thought this too high and finally settled for the 15 month period. There are still, therefore, 18,000 tractors to be officially earmarked for the program.

Of the 16,000 now on the books to be shipped to France, E. L. McCaffrey, President of International Harvester Co., told THE IRON AGE, International Harvester will ship about 8000. He said further, "This is very close to our prewar export shipments into this area."

Cast Grade Shipments Hit Low Level

New York

• • • **Openhearth prices** continued very firm and shipments of steelmaking grades generally were good. But foundry business is reported off in a number of markets to the extent that cast shipments have hit a low for the year. Cast grade prices haven't been changed in many cases simply because there isn't enough business being done to establish new figures.

Competition from both the East and Midwest for openhearth material which in the past has generally been conceded to Pittsburgh consumers is stirring up that market. Upgrading of material is being used as the bait to get steel scrap for the remote buyers. Material being shipped on these orders is reportedly a little better than openhearth grade, but not up to the prime grade specifications being paid for. Possibly reflecting this, low phos was up 50¢ in Pittsburgh.

A decrease in open market scrap activity is being laid to an increase in steel-getting deals. Fabricators are allegedly returning scrap to mills at prices as much as $10 a ton under the going price in order to encourage shipments of finished steel their way. In effect this amounts to paying the mills a premium for steel while allowing the producers to keep their books clean in showing regular priced billings. At the same time, the practice is encouraging out-of-district buying since it allows a mill to pay higher springboards and still show an average scrap cost that matches, or even may be under, the formula price.

•

PITTSBRGH—Shipments to some district mills are trending downward in the face of competition from the East and Midwest. Since the drop is in material that would normally come here there are indications of an unusual situation. According to trade reports the mills getting steel away from this area are doing so by ordering scrap of higher quality than openhearth material. They are said to be getting something a little better than openhearth grade though not up to specifications for the prime grades being ordered—and upon which the invoices are based. Cast holds at the price set last week—$1 lower than that of the previous week. Low phos was 50¢ stronger, quotable at $48 to $48.50.

•

CHICAGO—Scrap is moving in good volume. Very few expect the price to go down and nobody believes it will go up. Small electric furnace shops are still paying premium prices for good scrap, but the big tonnages are moving to the mills according to the formula agreement. A few railroad lists are pending but had not yet closed early in the week.

•

PHILADELPHIA—The market was unchanged in this district last week. The higher low phos price quoted last week has been substantiated by further orders placed at this level by consumers. Only one consumer is buying now at $48. Cast grades remain strong in this market at previously quoted levels. Shipments to mills continue at a high level and it is understood that shipbreaking tonnage is increasing. Ships are on hand at dockside to permit uninterrupted production for the next few months, but the cutting off of government ship disposals is certain to reduce ship tonnage within six months.

■

CLEVELAND—Most grades are firm here and in the Valley, with the exception of blast furnace, which is showing weakness as a result of consumers shying away because of quality. Cast is steady and in some quarters very strong. There is some consumer resistance to mixed grades and some shippers will probably be forced to segregate their material more carefully to stay in the high priced brackets. Openhearth material is moving at formula prices, but shipments run to those who pay over the market. Movement of material into scrap yards has definitely slowed down. Openhearth consumers are taking everything they can get.

■

DETROIT—Rumors persist here that an increasing tonnage of scrap is being moved at over-the-formula levels. The general tone of the market is strong, but there is not as yet sufficient evidence to warrant a change in prices. Meanwhile, cast iron goes begging for customers, with brokers and dealers admitting frankly that customers aren't buying. The volume of scrap moving is large, but extensive shutdowns in GM plants during the next ten days are expected to take a heavy toll in the amount of scrap generated.

■

BUFFALO—Principal consumers of No. 2 steel pressed dealers for increased deliveries on contracts last week as ingot production was raised to the highest level in 3 months. Shipments of open market scrap lagged, but reciprocal movements picked up. Some of the latter shipments were reported at prices considerably below the local formula, indicating that fabricators were resorting increasingly to deals in order to get finished steel. Under such an agreement, the fabricator pays in effect a premium for sheets, bars, or whatever, because he returns his scrap at cut-rate prices, but is billed for the finished product at the full rate. At the same time it enables a mill to reach out for scrap at higher springboards and still average out at, or even under, the formula. Cast grades continued unsettled because of reduced foundry operations attributed to the tightness of pig iron and coke.

•

BIRMINGHAM—Demand scrap remains strong here, but consumers are able to obtain requirements. Even supplies of cast are reported in sufficient supply to meet consumption. Prices are firm for all grades.

■

NEW YORK — There were no price changes in this market during the week. Foundry business has dropped off to the point where general buying interest is lower than it has been in some months. Steel grades are much stronger than the cast items, with still more buyers than sellers.

■

CINCINNATI—Demand for openhearth material is strong and the market generally is steady. As a result of the layoff by General Motors Corp., some foundries are holding up on scrap shipments. Plant vacations, or other possible reductions in operations, are resulting in less material moving into the scrap yards.

■

BOSTON—Cast scrap prices continue on the easy side here with the foundries in good inventory position and hard to please. Brokers are reluctant to quote prices especially for No. 1 and 2 machinery cast becase of the wavering market. In other scrap lines, the formula prices are holding, with business only fair.

■

ST. LOUIS—The usual summer slowdown in the movement of scrap iron from the farms and country dealers prevails, but still the supply is sufficient to take care of current consumption and the mills are said to be comfortably fixed.

To Produce Ferrotungsten

New York

• • • **Climax Molybdenum** Corp. is about to begin the production and sale of ferrotungsten from concentrates recovered in small quantities in tailings from its molybdenum mine operations at Climax, Colo. The compnay will also produce sodium tungstate, and may also produce tungsten briquettes. According to company officials, early test results indicate a high quality grade of ferrotungsten.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
RR. hvy. melting	41.00 to 41.50
No. 2 hvy. melting	40.00 to 40.50
RR. scrap rails	55.50 to 56.50
Rails 2 ft and under	62.50 to 63.50
No. 1 comp'd bundles	40.00 to 40.50
Hand bdld. new shts.	40.00 to 40.50
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.50 to 36.00
Shoveling turn.	38.00 to 38.50
Mixed bor. and turn.	35.50 to 36.00
Cast iron boring	38.00 to 38.50
No. 1 cupola cast	63.00 to 64.50
Hvy. breakable cast	52.00 to 53.00
Malleable	76.00 to 77.00
RR. knuck. and coup	55.00 to 56.00
RR. coil springs	55.00 to 56.00
RR. leaf springs	55.00 to 56.00
Rolled steel wheels	55.00 to 56.00
Low phos.	48.00 to 48.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 2 dealers' bundles	39.00 to 39.50
Bundled mach. shop turn.	37.00 to 37.50
Galv. bundles	35.00 to 35.50
Mach. shop turn.	34.00 to 34.50
Short shov turn.	35.50 to 36.50
Cast iron borings	36.00 to 37.00
Mix. borings & turn.	34.00 to 34.50
Low phos. hvy, forge	48.00 to 50.00
Low phos. plates	45.00 to 46.00
No. 1 RR. hvy. melt	41.25 to 41.75
Rerolling rails	54.00 to 55.00
Miscellaneous rails	51.00 to 52.00
Angles & splice bars	53.00 to 54.00
Locomotive tires, cut	54.00 to 55.00
Cut bolster & side frames	49.00 to 51.00
Standard stl. car axles	59.00 to 60.00
No. 3 steel wheels	51.00 to 52.00
Couplers & knuckles	54.00 to 55.00
Rails, 2 ft and under	56.00 to 57.00
Malleable	76.00 to 78.00
No. 1 mach. cast	69.00 to 70.00
No. 1 agricul. cast	60.00 to 63.00
Heavy breakable cast.	51.00 to 53.00
RR. grate bars	60.00 to 65.00
Cast iron brake shoes	58.00 to 59.00
Cast iron carwheels	58.00 to 59.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	38.50 to 39.50
No. 1 bundles	38.50 to 39.50
No. 2 bundles	38.50 to 39.50
Mach. shop turn.	33.00 to 33.50
Shoveling turn.	35.00 to 35.50
Cast iron borings	32.50 to 33.00
Mixed bor. & turn.	32.50 to 33.00
Low phos., plate	46.00 to 48.00
No. 1 cupola cast	63.00 to 64.00
Hvy. breakable cast	53.00 to 54.00
Rails 18 in. & under	60.00 to 61.00
Rails random length	50.00 to 51.00
Drop broken	66.00 to 68.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 hvy. melting	$31.65 to $31.90
No. 2 hvy. melting	31.65 to 31.90
Nos. 1 and 2 bundles	31.65 to 31.90
Busheling	31.65 to 31.90
Shoveling turn.	.... 28.90
Machine shop trun.	.... 26.90
Mixed bor. & turn.	26.90
Cl'n cast chem. bor.	37.50 to 38.00
No. 1 machinery cast	54.50 to 56.00
No. 2 machinery cast	52.50 to 54.00
Heavy breakable cast	52.50 to 53.00
Stove plate	51.00 to 52.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	.... $35.50
No. 2 hvy. melting	.... 35.50
No. 1 bundles	.... 35.50
New busheling	.... 35.50
Flashings	.... 35.50
Mach. shop turn.	$29.00 to 29.50
Shoveling turn.	30.00 to 30.50
Cast iron borings	30.00 to 30.50
Mixed bor. & turn.	28.50 to 29.00
Low phos. plate	39.50 to 40.50
No. 1 cupola cast	53.00 to 56.00
Heavy breakable cast.	48.00 to 52.00
Stove plate	48.00 to 50.00
Automotive cast	55.00 to 57.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	38.50 to 39.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	38.50 to 39.00
Mach. shop turn.	34.50 to 35.00
Shoveling turn.	34.50 to 35.00
Mixed bor. & turn.	34.50 to 35.00
Clean cast chemical bor.	42.00 to 44.00
No. 1 machinery cast	66.00 to 68.00
No. 1 mixed yard cast	62.00 to 63.00
Hvy. breakable cast.	63.00 to 64.00
Clean auto cast.	65.00 to 66.00
Hvy. axle forge turn.	44.00 to 45.00
Low phos. plate	48.00 to 49.00
Low phos. punchings	48.00 to 49.00
Low phos. bundles	46.00 to 47.00
RR. steel wheels	52.00 to 53.00
RR. coil springs	52.00 to 53.00
RR. malleable	75.00 to 78.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
Bundled sheets	37.50 to 38.50
Mach. shop turn.	33.00 to 33.50
Locomotive tires, uncut	46.00 to 47.00
Mis. std. sec. rails	46.50 to 47.50
Steel angle cars	.... 49.50
Rails 3 ft and under	52.00 to 53.00
RR. steel springs	48.50 to 49.50
Steel car axles	54.00 to 55.00
Grate bars	59.00 to 60.00
Brake shoes	57.00 to 58.00
Malleable	71.00 to 72.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast	65.00 to 67.00
Hvy. breakable cast	58.00 to 59.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy, melting	.... $37.50
No. 2 hvy, melting	.... 37.50
No. 2 bundles	.... 37.50
No. 1 busheling	.... 37.50
Long turnings	$25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Bar crops and plate	42.50 to 43.50
Structural and plate	42.50 to 43.50
No. 1 cupola cast.	64.00 to 67.00
Stove plate	63.00 to 64.00
No. 1 RR. hvy, melt.	.... 38.50
Steel axles	51.00 to 52.00
Scrap rails	44.00 to 45.00
Rerolling rails	51.00 to 53.00
Angles & splice bars	51.00 to 53.00
Rails 3 ft & under	52.00 to 55.00
Cast iron carwheels	50.00 to 55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
No. 2 hvy. melting	40.00 to 40.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	37.00 to 37.50
Cast iron borings	36.00 to 36.50
Low phos.	45.00 to 45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	.... 34.50
No. 2 bundles	.... 34.50
Mach. shop turn.	29.00 to 29.50
Mixed bor. & turn.	29.00 to 29.50
Shoveling turn.	31.00 to 32.00
No. 1 cupola cast	55.50 to 56.50
Clean auto cast	55.50 to 56.50
Hvy. breakable cast	55.00 to 56.00
Charging box cast	55.00 to 56.00
Unstrp. motor blks.	52.00 to 53.00
Cl'n cast chem. bor.	34.50 to 35.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy, melting	$39.75 to $45.00
No. 2 hvy. melting	.... 39.75
No. 1 bundles	.... 39.75
No. 2 bundles	.... 39.75
No. 1 busheling	.... 39.75
Mach. shop turn.	34.75 to 35.00
Shoveling turn.	35.00 to 36.00
Cast iron borings	.... 35.75
Mixed bor. & turn.	.... 34.75
No. 1 cupola cast	64.00 to 65.00
Mixed cupola cast	60.00 to 61.00
Charging box cast	56.00 to 57.00
Stove plate	60.00 to 61.00
Stove auto cast	60.00 to 61.00
RR. malleable	70.00 to 75.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	44.75 to 46.00
Scrap rails	50.00 to 52.00
Rails 3 ft & under	57.00 to 58.00
RR. steel wheels	51.00 to 52.00
Cast iron carwheels	51.00 to 52.00
RR. coil & leaf spgs.	51.00 to 52.00
RR. knuckles & coup.	51.00 to 52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
No. 1 bundles	39.50 to 40.00
No. 1 busheling	39.50 to 40.00
Drop forge flashings	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Shoveling turn.	36.50 to 37.00
Steel axle turn.	39.50 to 40.00
Cast iron borings	35.50 to 36.00
Mixed bor. & turn.	35.50 to 36.00
Low phos.	44.50 to 45.00
No. 1 machinery cast	73.00 to 76.00
Malleable	74.00 to 76.00
RR. cast.	73.00 to 74.00
Railroad grate bars	60.00 to 62.00
Stove plate	61.00 to 63.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft & under	60.00 to 61.00
Rails 18 in. & under	62.00 to 63.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 25.00
No. 2 bales	.... 25.00

Per gross ton delivered to consumer:

No. 3 bales	.... $19.50
Mach. shop turn.	.... 16.00
Elec. furn. 1 ft under	$32.00 to 34.00
No. 1 cupola cast	40.00 to 43.00
RR. hvy. melting	.... 26.00

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 25.00
No. 1 bales	.... 25.00
No. 2 bales	.... 25.00
No. 3 bales	.... 19.00
Mach. shop turn.	.... 17.50
No. 1 cupola cast	$45.00 to 50.00
RR. hvy. melting	.... 26.00

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt	.... $26.00
Elec. furn. 1 ft and under	.... 30.00
No. 1 cupola cast	.... 40.00
RR. hvy. melting	.... 28.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	28.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact, prep'd	21.00*
Bushelings, new fact, unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast	$42.00 to 46.00
No. 2 cast	35.00 to 37.00

*Ceiling Price.

loods Reduce Aluminum

ouisville, Ky.

• • **Production of aluminum** at ie Troutdale, Ore. plant of Reynolds Metals Co. has been stopped ue to the threat of flood waters in ie Northwest, according to an nouncement of David P. Reynds, vice-president. So far, there no water in the plant as it is ill protected by a system of dykes at have withstood the pressure waters at flood level. Army enneers, however, advised that the ant operation be discontinued lest ere be a break through. Accordg to Reynolds, it should be posble to resume operations of the ant within a month or six weeks the plant is not flooded. Meanile, an estimated 40 pct of the mpany's production has been opped.

It has not been necessary to disntinue the production of alumim at Alcoa's Vancouver, Wash. Reynolds' Longview, Wash. ant, although both are in the afcted area. Both plants' producon has been reduced because of e lower power potential of the nneville Power Administration e to high water in the tail-races. ie overall effect of the floods in e Pacific Northwest has been to back aluminum production at time of maximum domestic deand.

•

nc

• • **All grades of** zinc are in ort supply but consumers who e unable to obtain metal can get ne from the small Metals Reve stockpile. Most consumers efer to avoid this if possible beuse of the red tape involved and time lost before shipment. The tal that has gone into the stocke most recently is ordinary High ade which is more readily avail-e from producers than either ime Western or Special High ade, the grades in greatest dend. In buying from the stocke it is often necessary to accept grade other than the one red. The export prices of all c grades are being quoted well ve the domestic prices and the ongest threat to the domestic ce structure comes from this quarter. Joplin producers are dissatisfied with the current price of concentrates but have been resisting any action that would serve to jeopardize the possibility of passage of the subsidy legislation before adjournment. Those who have talked to Senate leaders on this measure last week find there is no possibility of its passage at this session.

•

Lead

• • • **Lead supplies** are extremely short, to the extent that many consumers are asking for their shipments as early as possible during the first week or two of the month. The plants operate while the supply of lead lasts, and then close down for the balance of the month. The reduction in requirements of the battery industry in recent months have been fully absorbed by the losses involved in the now terminated Mexican mine and smelter strikes. In consumer circles, there are reports of offerings of secondary metal at over 20¢ per lb. The late rise in the lead price was prompted by world reaction to the premiums of several cents per pound being paid above the domestic market. While there is no major producer who would care to see any further inflationary development in the lead price, it is recognized that all the elements which would contribute to such a development are present.

•

Private Tin Smelter To Use Low Grade Ore

Woodbridge, N. J.

• • • **Vulcan Detinning** Co. expects to have a new tin smelting plant in operation by the end of the year, the first privately operated plant of this kind in the country. The operation will be located near the company's present detinning plant. Initial production is to be at the rate of 5 tons a day, but this capacity may later be extended to 25 tons a day or more. The plant will be unique in that it will be able to operate on low grade Bolivian concentrates without any need for sweetening with higher grade concentrates. Details of the refining technique to be employed have not been disclosed, but it is understood that the process will involve chemical means different from any existent tin smelter.

Officials of the company hope to be able to obtain Bolivian concentrates containing 20 to 25 pct tin under the government contract with Bolivia.

The plant is to be constructed by Wigton, Abbott Corp., Plainfield, N. J., at a cost of $400,000.

•

Raise Metals Scrap Prices

New York

• • • **Dealers' buying** prices for aluminum scrap were increased by ½¢ per lb last week, reflecting recent increases in aluminum ingot prices and the shortages in virgin metal and scrap. Dealers' scrap intake is dependent almost entirely on industrial scrap in the absence of any appreciable tonnage growing out of auto wrecking operations. Dealers' prices for lead battery plates were also increased by ¼¢ as the result of the reduction of the smelting charge to $25 a ton. Ingot makers have raised their copper grade buying price by ¼¢, but very little copper scrap is being sold to them in view of the quiet ingot market.

Nonferrous Metals Prices

	June 9	June 10	June 11	June 12	June 14	June 15
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	..12.00
Lead, St. Louis	17.30	17.30	17.30	17.30	17.30	17.30

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, 10,000 lb, f.o.b shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$110 to $120
Lead, St. Louis	17.30
Lead, New York	17.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$75 to $77
Nickel, electro, f.o.b. New York	36.56
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$88 to $91
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	$1.03
Zinc, East St. Louis	12.00
Zinc, New York	12.65
Zirconium copper, 20 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.00–19.25
No. 120	18.50–18.75
No. 123	18.00–18.25
80-10-10 ingot	
No. 305	25.25
No. 315	22.25
88-10-2 ingot	
No. 210	31.00
No. 215	29.00
No. 245	23.25–23.75
Yellow ingot	
No. 405	15.25–16.00
Manganese bronze	
No. 421	19.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	21.75
0.60 copper, max.	21.50
Piston alloys (No. 122 type)	20.00
No. 12 alum, (No. 2 grade)	19.75
108 alloy	20.00
195 alloy	19.75
13 alloy	21.50
AXS-679	20.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct.-95½ pct.	20.50–21.00
Grade 2—92 pct-95 pct	19.50–20.00
Grade 3—90 pct-92 pct	19.00–19.50
Grade 4—85 pct-90 pct	18.50–19.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32⅜
Rolled, oval, straight, delivered	33.09
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33¾
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	44.00
Copper sulfate, 99.5, crystals, bbls.	12.50
Nickel salts, single, 425 lb bbls. frt. allowed	15.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	35.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 24¢; 4S, 61S-O, 25.8¢; 52S, 27.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢. 0.081 in.; 2S, 3S, 25¢; 4S, 61S-O, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 27.7¢; 75S-O, 75S-OAL, 34.3¢. 0.032 in.; 2S, 3S, 26.4¢; 4S, 61S-O, 30.1¢; 52S, 32.6¢; 24S-O, 24S-OAL, 34.2¢; 75S-O, 75S-OAL, 43.1¢.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 4S-F, 23.2¢; 52S, 24.2¢; 61S-O, 23.8¢; 24S-F,24S-FAL, 24.2¢; 75S, 75S-AL, 30.5¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ⅛ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; ⅛ to ⅛ in., 32.5¢ to 53.5¢; 9/64 to 3/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 30¢ to 26.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 32¢ to 28¢.

Screw Machine Stock: Drawn, ⅛ to 1½ in., 11S-T3, R317-T4, 45¢ to 34¢; cold-finished, ⅜ to 1½ in., 11S-T3, 33¢ to 31¢; ⅜ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1⅛ to 3 in., 11S-T3, 31¢ to 28.5¢; 2½ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 33¢ to 24¢ 52S, 40.5c to 29c; 56S, 42.5¢ to 34.5¢; 17S-T4, 46¢ to 31¢; 61S-T4, 41c to 30.5c; 75S-T6, 66¢ to 46¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.811, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 1.00 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 1/16 $1.14; 1/8 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅞ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.36*	31.39	31.70
Yellow brass	32.92*	29.85	30.16
Red brass	34.89*	31.92	32.23
Naval brass	30.28	29.03	34.97
Leaded brass	28.64	24.69	....
Commercial bronze	35.68*	32.96	33.27
Manganese bronze	33.87	32.37	38.47
Phosphor bronze, 5 pct	53.95*	52.95	52.70
Muntz metal	29.80	28.55	32.99
Everdur, Herculoy, Olympic, etc.	37.24	37.50	38.56
Nickel silver, 10 pct.	41.80	42.68	40.54
5 pct	....	....	38.98
Architectural bronze	28.61	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipment of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18¾
Yellow brass	15⅝	14¾
Red brass	17½	16¾
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅝
Leaded brass rod ends	15¾	...

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper, wire	18.50
No. 2 copper, wire	17.50
Light copper	16.50
Refinery brass	16.50–16.75*

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	18.50
No. 2 copper, wire	17.50
Light copper	16.50
No. 1 composition	14.50
No. 1 comp. turnings	14.00
Rolled brass	11.00
Brass pipe	11.25
Radiators	12.00
Heavy yellow brass	10.50
Aluminum	
Mixed old cast	11.50
Mixed old clips	11.50
Mixed turnings, dry	11.00
Pots & pans	12.00
Low copper	12.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16½—17
No. 2 heavy copper and wire	15½—16
Light copper	14¼—14¾
Auto radiators (unsweated)	9¾—10¼
No. 1 composition	12½—13
No. 1 composition turnings	12 —12½
Clean red car boxes	9½— 9¾
Cocks and faucets	9½—10
Mixed heavy yellow brass	8 — 8¼
Old rolled brass	9½— 9¾
Brass pipe	10 —10¼
New soft brass clippings	12¼—12¾
Brass rod ends	10 —10½
No. 1 brass rod turnings	9½—10

Aluminum

Alum. pistons with struts	6½— 7
Aluminum crankcases	9¼— 9½
2S aluminum clippings	10½—11
Old sheet & utensils	9½—10
Dry borings and turnings	4 — 4½
Misc. cast aluminum	9 — 9½
Dural clips (24S)	9 — 9½

Zinc

New zinc clippings	8 — 8½
Old zinc	6 — 6½
Zinc routings	3 — 3½
Old die cast scrap	4 — 4½

Nickel and Monel

Pure nickel clippings	17 —18
Clean nickel turnings	13 —14
Nickel anodes	17 —18
Nickel rod ends	17 —18
New Monel clippings	12 —13
Clean Monel turnings	8 — 9
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	9 —10
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½— 7

Lead

Soft scrap lead	15½—16
Battery plates (dry)	9½— 9¾

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	50 —52
Mixed common babbitt	14¼—14¾
Solder joints	19 —19½
Siphon tops	50 —52
Small foundry type	17½—18
Monotype	16¼—16¾
Lino. and stereotype	15½—16
Electrotype	13½—14
New type shell cuttings	14½—15
Hand picked type shells	6½— 7
Lino and stereo dross	8 — 8½
Electro dross	6 — 6½

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major basing points: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	June 15, 1948	June 8, 1948	May 18, 1948	June 17, 1947
Hot-rolled sheets	2.775	2.775	2.775	2.50
Cold-rolled sheets	3.495	3.495	3.495	3.20
Galvanized sheets (10 ga.)	3.913	3.913	3.913	3.55
Hot-rolled strip	2.775	2.775	2.775	2.50
Cold-rolled strip	3.535	3.535	3.535	3.20
Plates	2.93	2.93	2.93	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.70	$6.70	$6.70	$5.75
Tinplate, electro (0.50 lb)	5.90	5.90	5.90	5.05
Special coated mfg. ternes	5.80	5.80	5.80	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.875	2.875	2.875	2.60
Cold-finished bars	3.483	3.483	3.483	3.20
Alloy bars	3.213	3.213	3.213	3.05
Structural shapes	2.767	2.767	2.767	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire: (cents per pound)				
Bright wire	3.608	3.608	3.608	3.30
Rails: (dollars per 100 lb)				
Heavy rails	$2.725	$2.725	$2.725	$2.50
Light rails	3.05	3.05	3.05	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00†	$45.00†	$45.00†	$42.00
Slabs, rerolling	45.00†	45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	3.133	3.133	3.133	2.55
Skelp	2.888	2.888	2.888	2.35

†Net ton

Pig Iron: (per gross ton)	June 15, 1948	June 8, 1948	May 18, 1948	June 17, 1947
No. 2, foundry, Phila.	$44.85	$44.85	$44.85	$36.51
No. 2, Valley furnace	39.50	39.50	39.50	33.50
No. 2, Southern Cin'ti	45.47	45.47	45.47	34.75
No. 2, Birmingham	39.38	39.38	39.38	29.88
No. 2, foundry, Chicago†	39.00	39.00	39.00	33.00
Basic del'd Philadelphia	44.35	44.35	44.35	36.92
Basic, Valley furnace	39.00	39.00	39.00	33.00
Malleable, Chicago†	39.50	39.50	39.50	33.50
Malleable, Valley	39.50	39.50	39.50	33.50
Charcoal, Chicago	65.55	65.55	62.55	45.99
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
* Revised.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$40.25	$40.25	$40.25	$34.75
Heavy mlt'g steel, Phila.	42.50	42.50	42.50	33.75
Heavy melt'g steel, Ch'go	39.25	39.25	39.25	31.25
No. 1, hy, comp. sh't, Det.	35.50	35.50	35.50	30.00
Low phos. Young'n	45.25	45.25	45.25	35.75
No. 1, cast, Pittsburgh	63.75	63.75	64.00	36.50
No. 1, cast, Philadelphia	67.00	67.00	67.00	44.50
No. 1, cast, Chicago	69.50	69.50	73.50	43.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.75	$12.75	$12.50	$10.50
Foundry coke, prompt	16.50	16.50	14.00	11.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.625
Tin, Grade A, New York	$1.03	$1.03	94.00	80.00
Zinc, East St. Louis	12.00	12.00	12.00	10.50
Lead, St. Louis	17.30	17.30	17.30	14.80
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	33.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
June 15, 1948	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
A week ago	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
A month ago	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
A year ago	2.85664¢ per lb.	$33.15 per gross ton	$33.25 per gross ton

	HIGH		LOW		HIGH		LOW		HIGH		LOW	
1948	3.27585¢	Feb. 17	3.22566¢	Jan. 1	$40.53	May 18	$39.58	Jan. 6	$41.83	Jan. 29	$39.75	Mar. 9
1947	3.19541¢	Oct. 7	2.87118¢	Jan. 7	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.83599¢	Dec. 31	2.54490¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.44104¢	Oct. 2	2.38444¢	Jan. 2	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.30837¢	Sept. 5	2.21189¢	Oct. 5	$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.29176¢		2.29176¢		23.61		23.61		$19.17		$19.17	
1942	2.28249¢		2.28249¢		23.61		23.61		19.17		19.17	
1941	2.43078¢		2.43078¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	23.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 5
1935	2.07642¢	Oct. 1	2.06492¢	Jan. 8	18.84	Nov. 5	17.83	May 14	13.42	Dec. 10	10.33	Apr. 23
1934	2.15367¢	Apr. 24	1.95757¢	Jan. 2	17.90	May 1	16.90	Jan. 27	13.00	Mar. 13	9.50	Sept. 25
1933	1.95578¢	Oct. 3	1.75836¢	May 2	16.90	Dec. 5	13.56	Jan. 3	12.25	Aug. 8	6.75	Jan. 3
1932	1.89196¢	July 5	1.83901¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1931	1.99626¢	Jan. 13	1.86586¢	Dec. 29	15.90	Jan. 6	14.79	Dec. 15	11.33	Jan. 6	8.50	Dec. 29
1930	2.25488¢	Jan. 7	1.97319¢	Dec. 9	18.21	Jan. 7	15.90	Dec. 16	15.00	Feb. 18	11.25	Dec. 9
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound unless otherwise indicated. Extras apply. Delivered prices are minimum and do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Arbitrary delivered prices. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) from 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Deliverd Los Angeles; add 0.55¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. (18) 24 to 14 gage, up to 48 in.; 26 gage, up to 42 in.; 30 to 27 gage, up to 36 in.

PRODUCTS	Prices at basing points apply only to the sizes and grades produced at those points.												DELIVERED TO		
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Francisco, Los Angeles	Detroit[10]	New York	Philadelphia
INGOTS Carbon forging	$46.00	Rerolling ingots—$36.00 per net ton f.o.b. mill (Spot market as $75 to $90 per gross ton)													
Alloy	$56.00										Canton = $56.00				
BILLETS, BLOOMS, SLABS Carbon, rerolling[17]	$45.00	$45.00	$45.00	$47.00	$45.00	$45.00		$45.00							
Carbon forging billets	$54.00	$54.00	$54.00	$54.00	$54.00	$54.00	(per net ton)								
Alloy	$66.00	$66.00				(Bethlehem, Massillon, Canton = $66.00)									
PIPE SKELP	2.85 to 2.90						2.90								
WIRE RODS	2.80 to 3.55	2.80 to 3.80		2.80 to 3.05	2.85						Worcester = 2.90	3.5245[13]			
SHEETS Hot-rolled[6]	2.75 to 2.80	2.75 to 2.80	2.75	2.80	2.75 to 2.80	2.80	2.75 to 2.80	2.80		Ashland, Ky. = 2.80		3.494[16] to 3.6875	2.96 to 3.01	3.18 to 3.31	3.06 to 3.24
Cold-rolled[1]	3.45 to 3.50	3.45 to 3.55	3.45	3.50		3.55	3.55	3.55[18]	3.65	3.50			3.66	3.93 to 4.01	3.81 to 3.94
Galvanized (10 gage)	3.85	3.95	3.85 to 3.95		3.85 to 3.95		3.95	3.95	4.05	3.95	Ashland = 3.95	4.624[16]		4.33	4.21
Enameling (12 gage)	3.85	3.75	3.75 to 3.85	3.95			3.95		4.05	3.85			4.11 to 4.16	4.41	4.34
Long ternes[2] (10 gage)	4.05		4.05											4.61	4.54
STRIP Hot-rolled[3]	2.80	2.75 to 2.80	2.75	2.75 to 2.80	2.75		2.75 to 2.80					3.554[16] to 3.9125	2.96 to 3.01	3.36	3.29
Cold-rolled[4]	3.50	3.55 to 3.65	3.55	3.45 to 3.50			3.55			Worcester = 3.65 to 3.75			3.66	4.05	3.99
TINPLATE Cokes, 1.50 lb,[5] base box	6.70	6.70	6.70		6.80			6.80	6.90	(Warren, Ohio = $6.80)				7.18	7.06
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb coke base box price.														
BLACKPLATE, h.e., 29 ga.[11]	4.65	4.65	4.65					4.75	4.85					5.13	5.01
BARS Carbon Steel	2.85 to 2.90	2.85 to 2.90	2.85	2.90	2.85 to 2.90	2.90	2.85 to 2.90					3.579[16] to 3.629[16]	3.06 to 3.11	3.40	3.34
Reinforcing (billet)[7]	2.70 to 2.80	2.70 to 2.80	2.70		2.70		2.70	2.75				3.325[16]		3.13	3.01
Cold-finished[1]	3.45 to 3.55	3.45 to 3.55		3.45									3.60 to 3.76	4.01	3.94
Alloy, hot-rolled	3.20	3.20 to 3.30	3.20			3.30	3.20	Bethlehem, Massillon, Canton = 3.30						3.58	3.48
Alloy, cold-drawn	4.00 to 4.10	4.00 to 4.10		4.00		4.10		Massillon, Canton = 4.10						4.58	4.49
PLATE Carbon steel[12]	2.90 to 2.95	2.90 to 2.95	2.90 to 2.95	2.95	2.85 to 2.90		2.90 to 2.95	Coatesville = 3.45, Claymont = 3.65 2.95 Geneva, Utah = 2.90				3.8375[14]		3.33	3.21
Floor plates	4.05	3.95 to 4.05	3.95	4.05										4.61	4.54
Alloy	3.70	3.70	3.70						Coatesville = 4.80					4.28	4.19
SHAPES, Structural	2.75	2.75 to 2.80	2.75 to 2.80		2.75		Bethlehem = 2.80, Geneva, Utah = 2.75					3.424[16] to 3.49		3.06	2.98
MANUFACTURERS' WIRE[9] Bright	3.45 to 3.80	3.45 to 4.05		3.45	3.45 to 3.55					Worcester = 3.55 Duluth = 3.50		4.4645[13]		3.95	3.94
Spring (high carbon)	4.50	4.50		4.50					Worcester = 4.60 Trenton, Duluth = 4.75			5.5345[13]		5.00	4.99
PILING, Steel sheet	3.30	3.30				3.30								3.83	3.79

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00¢
8 to 16	48, 60, 72	14.50¢
7	48, 60	15.75¢
6	48, 60	17.00¢
4, 5	40	17.50¢
3	40	18.50¢
2½	24, 30	19.00¢
2	24, 30	21.00¢
Carbon		
40	100, 110	6.75¢
35	65, 110	6.75¢
30	65, 84, 110	6.75¢
24	72 to 104	6.75¢
17 to 20	84, 90	6.75¢
14	60, 72	7.25¢
10, 12	60	7.50¢
8	60	7.75¢

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Armature	4.70¢ to 5.05¢
Electrical	5.20¢ to 5.45¢
Motor	5.95¢ to 6.30¢
Dynamo	6.65¢ to 7.50¢
Transformer 72	7.15¢ to 8.25¢
Transformer 65	7.85¢ to 9.20¢
Transformer 58	8.55¢ to 9.90¢
Transformer 52	9.35¢ to 9.70¢

F.o.b. Chicago and Gary: armature through motor only. F.o.b. Granite City add to lower quotation 0.55¢ for armature through and including 72, and 0.45¢ for balance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$2.70 to $2.75*
Joint bars, 100 lb	3.75
Light rails (from billets) per 100 lb.	3.05

CF&I charges $3.05.

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.55¢
Tie plates, Pittsburg, Calif.	3.70¢
Track bolts	7.00¢
Track bolts, heat treated, to railroads	7.25¢

C-R SPRING STEEL

Base per pound f.o.b. Pittsburgh, Cleveland

0.08 to 0.40 carbon	3.45¢
0.41 to 0.60 carbon	4.95¢
0.61 to 0.80 carbon	5.55¢
0.81 to 1.05 carbon	7.05¢
1.06 to 1.35 carbon	9.35¢
Worcester, add 0.20¢	

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville	24.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Birmingham

	Base Column	San Francisco
Standard & coated nails*	91	112
Galvanized nails*	91	112
Woven wire fence†	97	120
Fence posts, carloads††	104	...
Single loop bale ties	94	118
Galvanized barbed wire**	111	131
Twisted barbless wire	111	...

* Also Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80-rod spools, in carloads. †† Duluth only.

	Base per 100 lb	San Francisco
Annealed fence wire‡	$4.10	$5.1145
Annealed, galv. fencing‡	4.55	5.5645
Cut nails, carloads‡‡	6.15	...

‡ Add 10¢ at Worcester. ‡‡ Wheeling only, Pittsburgh add 15¢ (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	MAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.45	4.55	4.55	4.45	4.55	4.45	4.55	4.55
Sheets									
Hot-rolled	4.30	4.20	4.30	4.50	4.20	4.30	4.20	4.30	4.30
Cold-rolled	5.30	5.20	5.30	....	5.20	5.30	5.20	5.30	5.30
Galvanized	.	5.90	....	....	5.90	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.20	4.30	....	4.20	4.30	4.20	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.20	....	....	4.20	4.30	4.20	4.30	....
Beams	....	4.20	....	....	4.20	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.35	4.45	....	4.35	4.45	4.35	4.45	4.45
Bar shapes	....	4.35	....	....	4.35	4.45	4.35	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton
One producer allows 1 point less discount on steel buttweld.

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
⅛-in.	48	30½
¼-in.	51	34½
1-in.	53½	37½
1¼-in.	54	38
1½-in.	54½	38½
2-in.	55	39
2½ and 3-in.	55½	39½
Wrought Iron, buttweld		
⅛-in.	+11	+35
¼-in.	+ 1½	+25
1 and 1¼-in.	4	+16½
1½-in.	9½	+13
2-in.	10	+12½
Steel, lapweld		
2-in.	44½	28
2½ and 3-in.	48½	32
3½ to 6-in.	50½	34
Steel, seamless		
2-in.	43½	27
2½ and 3-in.	46½	30
3½ to 6-in.	48½	32
Wrought Iron, lapweld		
2-in.	1½	+20
2½ to 3½-in.	4	+16
4-in.	8	+10½
4½ to 8-in.	6	+12

Extra Strong, plain ends

Steel, buttweld		
⅛-in.	46	30
¼-in.	50	34
1-in.	52	37
1¼-in.	52½	37½
1½-in.	53	38
2-in.	53½	38½
2½ and 3-in.	54	39
Wrought Iron, buttweld		
⅛-in.	+ 6½	+29
¼-in.	+ ½	+23
1 and 1¼ in.	4	+16½
2-in.	10	+12½
Steel, lapweld		
2-in.	43½	28
2½ and 3-in.	48½	33
3½ to 6-in.	52	36½
Steel, seamless		
2-in.	42½	27
2½ and 3-in.	46½	31
3½ and 6-in.	50	34½
Wrought Iron, lapweld		
2-in.	4½	+16½
2½ to 4-in.	13	+ 6
4½ to 6-in.	9	+10½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

OD in in.	Gage BWG	Seamless* Hot-Rolled	Seamless* Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$17.84	$20.99	$17.30	$20.36
2½	12	23.99	28.21	23.27	27.36
3	12	26.68	31.40	25.88	30.46
3½	11	33.35	39.26	32.35	38.08
4	10	41.40	48.70	40.16	47.24

* One company charges approx. 2 pct less.

CAST IRON WATER PIPE

Per net ton

6-in to 24-in., del'd Chicago $98.76
6-in. to 24-in., del'd New York 95.50
6-in. to 24-in., Birmingham 85.50
6-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less 112.30
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

Percent Off List

⅛ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

⅛ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
⅛ in. through 1 in.	..	44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate ..... 65 and 10
In bulk 75
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets (½ in. and larger)

Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $5.65
F.o.b. Lebanon, Pa. 5.80

Small Rivets (7/16 in. and smaller)

Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 55

Cap and Set Screws

(In packages) *Percent Off List*

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	57
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe	90.0¢ to $1.75
Aluminum	23.0¢
Antimony	46.0¢
Brass	24.0¢ to 28.5¢
Copper, electrolytic	30.625¢
Copper, reduced	30.5¢
Cadmium	$2.40
Chromium, electrolytic, 99% min.	$3.50
Lead	24.0¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	51.5¢
Nickel, spherical, minus 30 mesh	53.0¢
Silicon	29.0¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.11
Tungsten, 98%, 99%	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$12.00 to $13.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	16.00 to 17.00
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.50
Detroit, f.o.b.	18.50
New England, del'd	21.75
Seaboard, N. J., f.o.b.	20.50
Philadelphia, f.o.b.	19.50
Swedeland, Pa., f.o.b.	19.50
Ashland, Ohio, f.o.b.	18.25
Painesville, Ohio, f.o.b.	19.45
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birminham, del'd	16.71

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	*Carloads, Per 1000*
No. 1 Ohio	$67.00
First quality, Pa., Md., Ky., Mo., Ohio	73.00
First quality, New Jersey	78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	67.00
Sec. quality, New Jersey	70.00
No. 2 Ohio	59.00
Ground fire clay, net ton, bulk	10.50

Silica Brick

Pennsylvania and Birmingham	$73.00
Chicago District and Alabama	82.00
Silica cement, net ton (Eastern)	12.50
East Chicago	13.50

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$64.00

Magnesite Brick

Standard, Balt. and Chester	$86.00
Chemically bonded, Baltimore	75.00

Grain Magnesite

std. ⅜-in. grains

Domestic, f.o.b. Balt. and Chester in bulk, fines removed	$51.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	27.00
in sacks with fines	31.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢ $11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.45-4.67	$5.66-5.77	$5.90-5.92	$4.86-5.36	....	$4.87	$4.58	$4.91	$5.65-5.73	$8.50-8.65	$8.80	$10.38	$10.53
New York	4.74-4.79	5.70[1]-5.95[1]	6.19	5.08-5.58	$6.05-6.30	5.09-5.14	4.77-4.82	5.05-5.08	5.78	8.58-8.73	8.73-8.88	10.23-10.43	10.43-10.58
Boston	4.88	5.74	6.28	5.64	6.90	5.23	4.94	5.09	5.96	9.05	9.20	10.51	10.66
Baltimore	4.27	....	5.62	4.79	....	4.72	4.69	4.84	5.66	....	....	.....	.....
Norfolk	4.90	....	....	5.30	....	5.15	5.15	5.20	6.00	....	....	.....	.....
Chicago	4.20	5.00	5.88	4.35	5.35-6.65	4.55	4.35	4.35	5.00-5.10	8.20	8.35	9.50	9.65
Milwaukee	4.57	5.37	5.95	4.72	5.83	4.92	4.72	4.72	5.334-5.58	8.53	8.68	9.78	9.98
Cleveland	4.20	5.00[1]	5.74	4.52	5.95	4.55†	4.67	4.35	5.00-5.10	8.64	8.79	9.50	9.65
Buffalo	4.25	5.15	6.06	5.26	5.72	4.96	4.40‡	4.40‡	5.10	8.20	8.35	9.50	9.65
Detroit	4.60	5.45	6.07	4.80	5.70	4.90†	4.80	4.50	5.16	8.72-8.87	8.87-9.02	9.94-10.17	10.14-10.32
Cincinnati	4.59	5.22	5.57	4.80	....	4.96	4.80	4.76	5.59	8.85	9.00	10.16	10.31
St. Louis	4.59	5.39	6.17-6.27	4.69-5.24	5.97	4.89-4.94	4.74	4.74	5.62	8.82	8.97	10.07	10.27
Pittsburgh	4.20-4.25	5.10[1]	5.65	4.30-4.35	....	4.55	4.35	4.35	5.00	8.20	8.35	9.50	9.65
St. Paul	4.68	5.53	6.08	4.78	....	5.03	4.83	4.83	6.00	....	....	.....	.....
Omaha	5.31	....	6.76	5.41	....	5.66	5.41	5.46	6.06	....	....	.....	.....
Indianapolis	4.52	5.31	5.96	4.62	5.72-5.87	4.87	4.67	4.67	5.52	....	....	9.97	10.17
Birmingham	4.45[11]	....	5.80	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.13	....	....	.....	.....
Memphis	4.91[11]	5.98[1]	5.08[11]	5.11[11]	5.23[11]	5.21[11]	5.01[11]	5.01[11]	5.50	....	....	.....	.....
New Orleans	5.05[11]	6.39[1]	....	5.25[11]	....	5.40[11]	*5.10[11]	*5.20[11]	6.39[6]	....	....	.....	.....
Houston	5.55	....	7.21	5.65	....	5.90	5.70	5.70	7.00	9.40	9.25	10.40	10.55
Los Angeles	5.70	7.25[1]	7.30	6.00	8.60[5]	5.35	5.15**	5.45	7.25[14]-7.35[14]	9.55[15]	9.40[15]	10.95[15]	11.15[15]
San Francisco	5.35[8]	6.55	7.05	5.70[8]	8.60	5.30	5.10	5.00	7.40	9.55[15]	9.45[15]	11.05[15]	11.20[15]
Seattle	5.45[4]	7.25[2]	7.10[2]	6.15[4]	....	5.60[4]	5.30[4]	5.65[4]	7.35[14]-7.45[14]	8.70[15]	9.70[15]	.....	11.30[15]
Portland	7.70[4]	7.25[2]	7.10	5.85[4]	....	5.70[4]	5.40[4]	5.65[4]	7.45[14]	....	8.95[6]	.....	11.30[15]
Salt Lake City	6.40	....	7.85	6.70	....	6.00	6.25	6.58	7.55	....	....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.
† Up to ¾ in. thick and 90 in. wide.
‡ Add 41¢ for sizes not rolled at Buffalo.
** Add 15¢ for sizes not rolled at Geneva.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	40.00	40.50	41.00	41.50	.....
Birmingham	38.88	39.38	.....	.....	.....
Buffalo	40.00-42.38*	40.00-42.88*	40.50-43.38*	.....	.....
Chicago	38.50	39.00	39.50	40.00	.....
Cleveland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....
Duluth	39.00	39.50	40.00	40.50	.....
Erie	38.50	39.00	39.50	40.00	.....
Everett		45.00	45.50	.....	.....
Granite City	46.25	45.75	46.25	.....	.....
Neville Island	42.00	42.50	42.50	43.00	.....
Provo	39.00	39.50	.....	.....	.....
Sharpsville	39.00	39.50	39.50	40.00	.....
Steelton	40.00	.....	.....	.....	46.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	38.50	39.00	39.50	40.00	.....
Troy, N. Y.	.....	.....	.....	.....	46.00
Youngstown	39.00	39.50	39.50	40.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	6.27	46.27	.....	.....	.....	52.27
Brooklyn	Bethlehem	3.90	43.90	44.40	44.90	45.40	.....
Cincinnati	Birmingham	6.09	44.97	45.47	.....	.....	.....
Jersey City	Bethlehem	2.39	42.39	42.89	43.39	43.89	.....
Los Angeles	Provo	6.93	45.93	44.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	41.53-42.78*	42.03-43.28*	42.53-43.78*	.....	.....
Philadelphia	Bethlehem	2.17	42.17	42.67	43.17	43.67	.....
Philadelphia	Swedeland	1.31	46.31	46.81	47.31	47.61	.....
Philadelphia	Steelton	2.81	42.81	.....	.....	.....	48.81
San Francisco	Provo	6.93	45.93	46.43	.....	.....	.....
Seattle	Provo	6.93	45.93	46.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	46.00	46.50	47.00	.....	.....

* Republic Steel Corp. price. Basis: pig iron at Cleveland and Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$53.50; f.o.b. Buffalo—$50.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $58.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $65.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	189.00
Delivered Pittsburgh	151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$51.00	$52.00
F.o.b. Pittsburg.h.	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk	7.80
Ton lots	9.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	16.90	17.50	18.10
97% Si, 1% Fe	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C.	97.00	98.50	99.75
0.50% max. C.	93.00	94.50	95.75
9.00% min. C.	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots	$1.85	$2.70 $3.40
Less ton lots	2.20	3.05 4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.35
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.	80¢
Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$152.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
Less ton lots	$1.25
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.20¢
Ton lots	7.70¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.50¢
Ton lots	10.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

Eastern	Central	Western
$1.20	$1.22	$1.21

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	93¢
No. 6	63¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.

Ton lots, per pound	8.0¢

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B | $6.38

Carbon CONTROL

WITH GREATER PRECISION AND SPEED

The improved Dietert-Detroit Carbon Determinator provides an easy method for making either preliminary or final carbon tests on all metals, organic or inorganic materials.

Principal Advantages:

RELIABLE: Results reproduced consistently—minimum chance for human error.

FAST: Results available within 2 minutes after sample is weighed.

ECONOMICAL: Low first cost and low operating costs.

WIDE RANGE: Burettes available for low carbon materials, steels, irons and organic substances.

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2. Includes combustion gas cooler.
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5. Absorption vessel and gas burette integral and remain at same temperature.
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SAND • MOLD • MOISTURE • SULFUR • CARBON

PERSONALS

(Continued from Page 112)

• **George C. Schreiber,** of Claude B. Schneible Co.'s sales engineering department, has been placed in charge of the Northern Illinois and Wisconsin territories with headquarters in Chicago.

• **Lawrence M. Muse** has been appointed assistant to G. L. Hehl, general manager industrial division of the Sherwin-Williams Co., Cleveland. For the past year and a half Mr. Muse has been assistant director of Sherwin-Williams' southeastern district with headquarters in Atlanta.

• **Harry W. Brown** has been appointed sales manager of the automotive department, U. S. Rubber Co., New York, succeeding **S. E. Abramson,** who has retired after 51 years of service. Mr. Brown has held various sales positions in the U. S. Rubber Co. since 1937. He will be located at the company's Fort Wayne, Ind., plant. **E. J. Briske** has been appointed Detroit district manager of the automotive department. Mr. Briske has been associated with the company since 1927, and in recent years has served as an assistant to Mr. Abramson.

• **Elmer H. Weihe,** who has been with Owens-Corning Fiberglass Corp., Toledo, and predecessor companies for over 30 years, has been named assistant treasurer of the Fiberglass Corp. He had been credit manager of the corporation since 1942.

• **William Davitt** and **Charles M. Edwards** have been appointed assistant comptrollers of the Studebaker Corp., South Bend, Ind. Mr. Davitt has been associated with Studebaker since 1936 and Mr. Edwards joined the Studebaker accounting staff in 1940.

• **Joseph V. Donohue, Jr.** has been appointed eastern regional sales manager for Rheem Mfg. Co. with headquarters in New York. He most recently was associated with Schick Inc.

• **Graham J. Logan** has been appointed assistant superintendent of McConway & Torley Corp., Pittsburgh. He joined McConway & Torley in 1922.

• **R. J. Hartung** has been promoted to controller of the radio tube division of Sylvania Electric Products Inc., Emporium, Pa. He was formerly assistant controller.

• **Robert M. Stanley** has resigned as vice-president in charge of engineering of the Bell Aircraft Corp., Buffalo. **Roy J. Sandstrom,** chief

PERSONALS

technical services in charge of l's military engineering work. s been named executive chief en- eer.

hester J. Janecki has been ap- nted supervisor of schedules at Wickwire Spencer Steel plant Buffalo. Mr. Janecki has been a mber of the scheduling staff ce 1934.

David B. Folkerth of the General ctric Co.'s plastics sales office. s been named chemical depart- nt district representative at the tsburgh office.

Frank E. Golliher has been ap- nted production supervisor of 's plastics division in Pittsfield, ss. Mr. Golliher was appointed the staff of the manufacturing nager of the plastics division in 5. **Charles W. Bentley** has been de assistant to the manager of 's new Decatur, Ill. plastics mold- plant. Before coming to Gen- l Electric Mr. Bentley was em- yed as manager of the compres- n molding plant of the Pro-Phy- c-Tic Brush Co.

George Stevens, formerly with zabeth Arden and McKesson- bbins, has been named executive e-president and a director of the ith Victory Corp., Buffalo. **Theo- re Landy,** former sales manager Al Rosenfeld, Inc., has been ap- nted sales manager and a direc- of Smith Victory.

John J. Boland has been pro- ted to chief application engineer the Meyer Furnace Co., Peoria, He has been with Meyer Furn- since 1947.

John E. Murphy has resigned as istant treasurer of the Buffalo t Co., Buffalo.

Robert W. Knauft has been elect- vice- president in charge of sales d **Edward L. Bohn** vice-president charge of production of the Chas ylor Sons Co., Cincinnati. Mr. auft has been associated with firm since 1930 working as a d representative and as general es manager since 1942. Mr. Bohn ned the Chas. Taylor Sons Co. in 7. He served as manager of the clay products division in 1946.

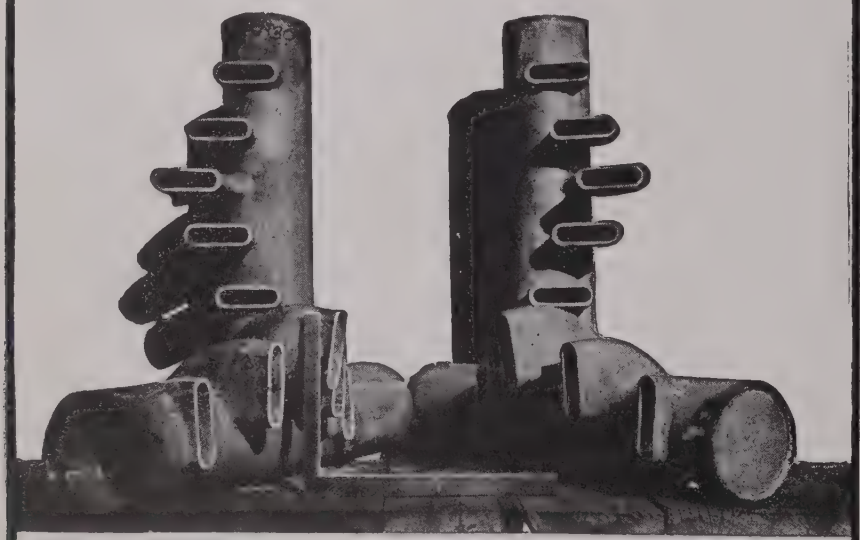
Neil W. Vogt, formerly manager distributor sales office and **Rol- d L. Smith,** formerly assistant es promotion manager, have been pointed assistant sales managers the distributor sales department Pittsburgh Plate Glass Co., De- it.

Orrin E. Wolf has been elected e-president of Hotpoint Inc.,

DURALOY

Queer Looking, Aren't They?

They're the left and right burners for an ingot treating furnace, each weighing about 600 pounds, alloyed with about 25% chromium and 12% nickel. The manifold openings were cast separately and then welded onto the centrifugally cast pipes.



These burners are typical of the countless different shapes and sizes of high alloy castings made for Duraloy and Duraspun customers. To *every job* we bring the experience that comes from working in this field continuously and exclusively since 1922. To *every job* we bring the facilities of one of the most modern high-alloy foundries in the country.

If you would like suggestions as to the proper alloying for your chrome-iron and chrome-nickel casting requirements, our metallurgists will be glad to help.

THE DURALOY COMPANY

Office and Plant Scottdale, Pa. • *Eastern Office* 12 East 41st Street, New York 17, N. Y.

Los Angeles & San Francisco
KILSBY & HARMON

Detroit
F. B. CORNELL & ASSOCIATES

METAL GOODS CORP. St. Louis • Houston • Dallas • Tulsa • New Orleans • Kansas City

PERSONALS

Chicago, and manager of the newly-established commercial cooking equipment division. Mr. Wolf has been a vice-president of Zenith Radio Corp., and previously he was for many years an executive of Frigidaire Div., General Motors Corp.

• **John H. Redmond,** former vice-president and general manager of Precisioneering, Inc., Pittsburgh, has assumed the position of assistant production manager of Koppers Co., Inc., Pittsburgh. He succeeds **Lenvik Ylvisaker,** who has been made assistant general manager of Koppers' piston ring division in Baltimore.

• **D. W. DuVall** has been appointed eastern sales manager of H. W. North Co. with headquarters at Upper Montclair, N. J.

• **Robert Watson** has been appointed representative of the railway equipment division of the American Welding & Mfg. Co., Warren, Ohio. Mr. Watson will make his headquarters in the American Welding regional offices in Chicago From 1941 to 1948 he was assistant to the president, and vice-president of Waugh Equipment Co.

• **Alfred N. Lawrence** has been appointed aviation division sales manager, Jack & Heintz Precision Industries, Inc., Cleveland. Mr. Lawrence has been with Jack & Heintz for the past 4 years.

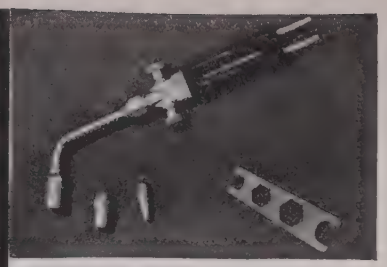
• **Gretta Scott** has joined the staff of Hall Laboratories, Pittsburgh. Miss Scott formerly served as research assistant in x-ray work with the Natural Sciences staff at the University of Pittsburgh.

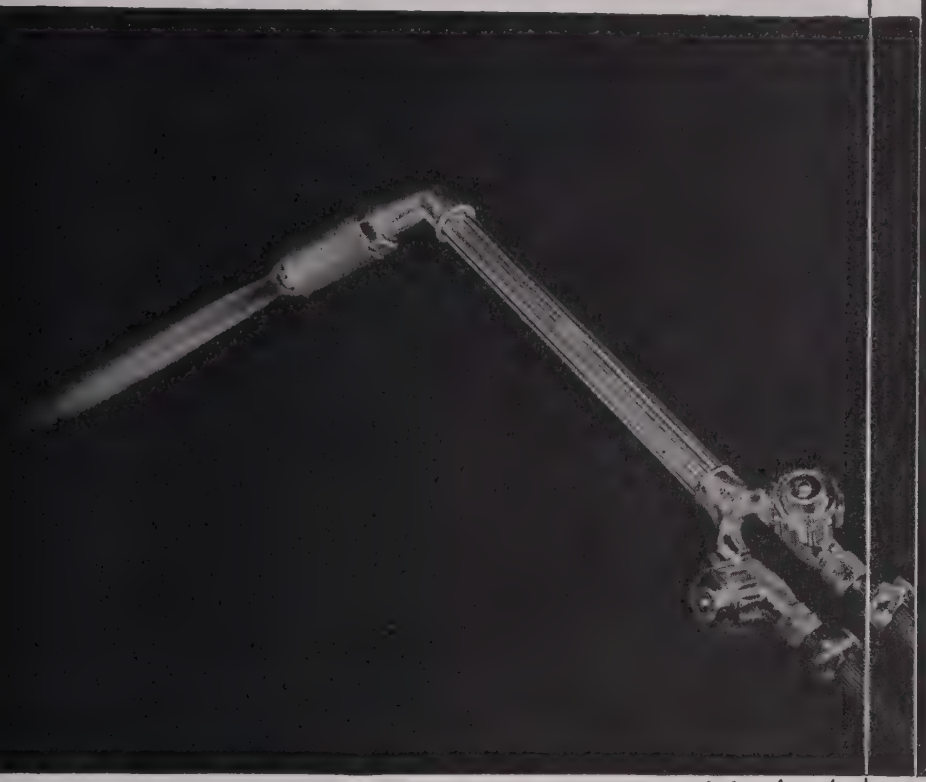
• **John H. Hauser** has been appointed assistant manager of the distributor sales department, radio division, Sylvania Electric Products Inc., Emporium, Pa. He was formerly supervisor of distributor sales.

• **George F. Comstock,** for many years chief metallurgist of the Titanium Alloy Mfg. Co., has been appointed assistant director of research for the TAMCO Laboratories.

• **F. J. Hilsinger** has been appointed works controller at Harrison, N. J. for the Atha and Spaulding & Jennings controller's departments, Crucible Steel Co. of America. Mr. Hilsinger was previously with Peat, Marwick & Mitchell, **J. G. Harwick** has been appointed chief accountant, Spring Works of Crucible Steel Co., McKees Rocks Pa, He was previously with Crump Construction Co.

jewelers, dental laboratory technicians, hobbyists, and anyone interested in light brazing or soldering operations welcomes this new Model 3401, "four-in-one" torch, illustrated to the right. you can use this torch with any practical fuel gas such as acetylene, natural gas, city gas or liquefied petroleum gas in combination with compressed air or oxygen; and it produces an ideal flame for such operations.

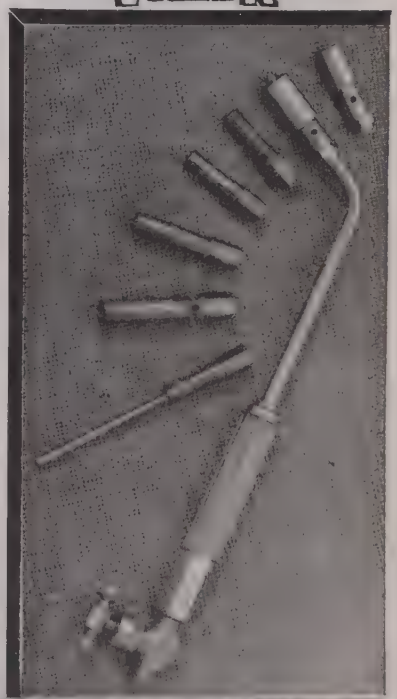




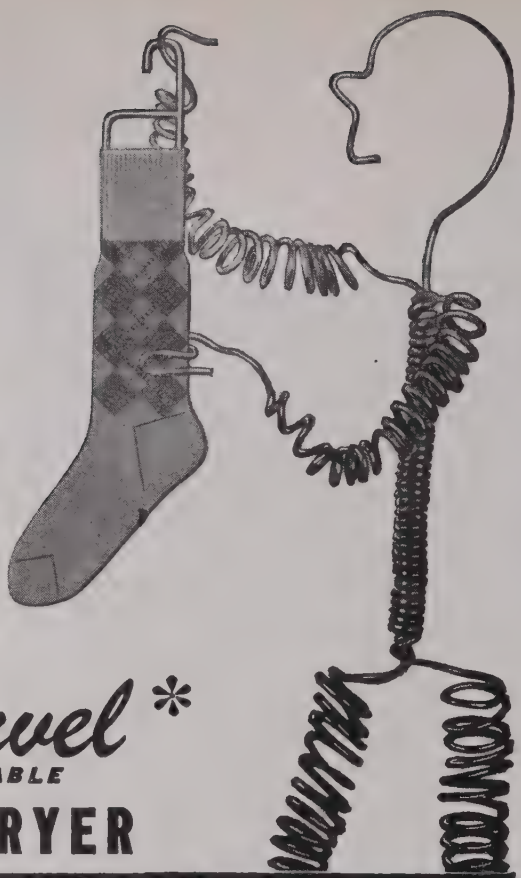
Made by - - - - VICTOR

put this air-gas heating torch into your hand . . . feel it do its job swiftly and efficiently. watch it in windy, drafty places . . . it holds its flame. the new tip construction gives ideal flame protection with maximum heat. you may secure this outstanding heating torch in several useful sizes — for preheating, brazing, soldering or bending and straightening operations. it utilizes compressed air with either natural gas or one of the liquid petroleum gases, such as butane or propane.

the bunsen burner type torch (right). this victor bunsen burner type of torch, model N600, may be provided with tips using natural gas or one of the liquefied petroleum gases or acetylene — the needed air is siphoned into the torch — tips are made in several useful sizes including the radiator repair tips. this little torch is excellent for a range of lighter soldering and brazing operations.



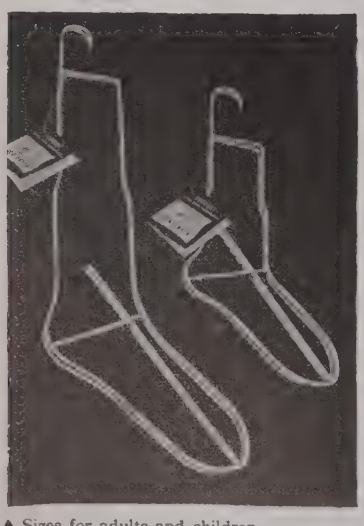
VICTOR EQUIPMENT COMPANY • 844 Folsom Street • San Francisco 7 • GArfield 1-3001
3821 Santa Fe Ave. • Los Angeles 11 • LAfayette 1281



SHRINKAGE STOPPED

with Marvel* ADJUSTABLE SOCK DRYER

made of KEYSTONE WIRE



▲ Sizes for adults and children.

Three different types of Keystone wire are used in the construction of Marvel Sock Dryers. The framework requires wire that is stiff and sturdy . . . yet ductile for easy forming . . . plus an *exrta clean brite* finish especially suitable for spot welding and chrome plating. The adjusting rod is formed from special *flattening quality* wire . . . while the tension spring is coiled from Keystone *music spring* wire.

Whatever your industrial wire requirements, Keystone can normally supply them.

**Lee-Rowan Company*
6301 Etzel Ave., St. Louis 14, Mo.

KEYSTONE MUSIC SPRING WIRE

KEYSTONE STEEL & WIRE CO. PEORIA 7, ILLINOIS

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

PERSONALS

• **Elmer E. MacGrogan** has bee appointed factory accountant fo Willys-Overland Motors, Toledo Mr. MacGrogan came to Toledo i 1943 to be in charge of the audi group at Willys. He succeeds **D. C Fabiani** who has resigned to be come comptroller of the America Swiss Co., Toledo. **Lowell Pugsley** formerly in charge of special proj ects on the administrative plan ning staff of Willys-Overland, ha been appointed cost analyst fo the procurement division.

• **Allan A. Watson** has been ap pointed sales manager of th Trumbull Electric Mfg. Co.. Plain ville, Conn. He was manager o the company's Norwood, Ohio plan until his present appointment.

• **Frank J. O'Brien,** president an director of Metal & Thermit Cor and Chromium Corp. of America has been elected a director of th Norma-Hoffman Bearings Corp Stamford, Conn.

• **J. I. Hammond** and **E. M Schoemmell, Jr.** have been appoint ed sales representatives of Osbor Mfg. Co. Mr. Hammond has bee assigned to the company's cen tral Pennsylvania territory. M Schoemmell will cover the terri tory including Maryland, Virginia North and South Carolina an Washington, D. C. **Robert Ruther berg** has joined the staff of th Osborn Co.'s Chicago office. He ha been with the company since 194 as sales engineer in the Clevelan headquarters office. **John D. Ash lin** has been appointed to the sale staff of Osborn's Detroit office.

• **Robert N. Griffith** has been ap pointed manager, Indianapolis dis trict sales office, Berger Mfg. Div Republic Steel Corp. for Indian and part of Kentucky. Mr. Griffit started with the Truscon Steel Co Republic subsidiary, in 1939 an later that year was transferred t the Berger Div.

• **George Squibb** has been appoint ed chief engineer of the Detro Broach Co.. Detroit, replacing **Leo Caplen,** who has resigned, but wi continue to be associated with De troit Broach in the capacity o consulting engineer. Mr. Squib was formerly employed by the Cin cinnati Milling Machine Co.

• **Littleton C. Barkley** has been ap pointed general sales manage asbestos and rubber products, We Coast Div., Raybestos-Manhatta Inc., Passaic, N. J. Mr. Barkley ha been with the Manhattan Rubb Div. for 23 years.

CUMBERLAND GROUND SHAFTS

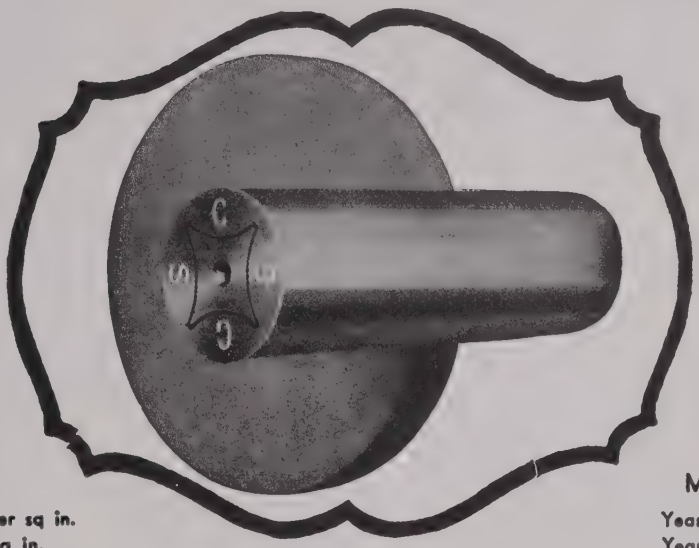
An Exclusive Product made by an Exclusive Method

DIAMETERS 1⅛" to 8" INCLUSIVE

•

MINIMUM ELASTIC LIMIT

Cumberland Brand—30,000 lb per sq in.
Potomac Brand—45,000 lb per sq in.
Cumsco Brand—55,000 lb per sq in.



CONCENTRIC STRAIGHT ACCURATE

•

MAXIMUM LENGTHS MANUFACTURED

Year 1845—up to 16 feet
Year 1886—up to 25 feet
Year 1945—up to 70 feet

They are carefully ground to our standard manufacturing tolerance, plus nothing to minus .002" on diameters 1-1/8" to 2-7/16" inclusive . . . plus nothing to minus .003" on diameters 2-1/2" to 8" inclusive. Closer tolerance can be furnished, if desired.

•

IMMEDIATE SHAFTS

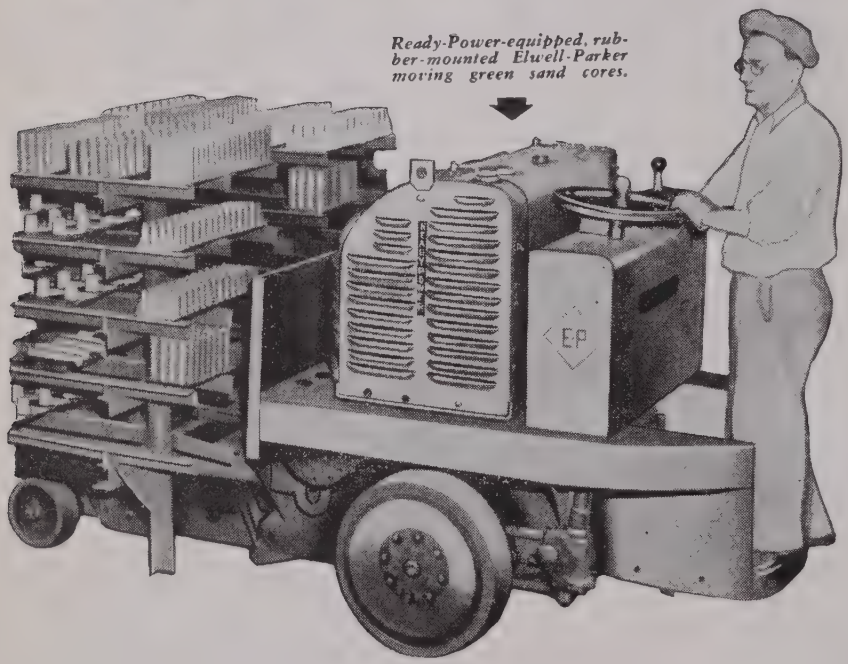
Distributed by

Baltimore, Maryland—Addison Clarke & Bro.
Boston, Mass.—Hawkridge Brothers Company
Boston, Mass.—Brown-Wales Company
Bridgeport, Conn.—Hunter & Havens, Inc.
Buffalo, New York—Jos. T. Ryerson & Son, Inc.
Chicago, Ill.—Central Steel & Wire Co.
Cincinnati, Ohio—Jos. T. Ryerson & Son, Inc.
Cleveland, Ohio—The Bissett Steel Company
Dayton, Ohio—Central Steel & Wire Co.
Detroit, Michigan—Central Steel & Wire Co.
Fort Worth, Texas—C. A. Fischer
Hartford, Conn.—Hunter & Havens, Inc.
Indianapolis, Ind.—Tanner & Company
Jersey City, N. J.—Jos. T. Ryerson & Son, Inc.
Kansas City, Mo.—F. H. Turner
Lakeland, Fla.—Mine & Mill Supply Co.
Los Angeles, Calif.—Link-Belt Co., Pacific Div.
Louisville, Ky.—Neill-LaVielle Supply Co.
Martinsburg, W. Va.—W. H. Heiston & Son
Montreal, Can.—Drummond, McCall & Co., Ltd.
New York City, N. Y.—Bright Steel Corp.
Oakland, Calif.—Link-Belt Co., Pacific Div.
Philadelphia, Pa.—Charles Bond Company
Philadelphia, Pa.—Horace T. Potts Co.
Pittsburgh, Pa.—McKee-Oliver, Inc.
Portland, Maine—W. L. Blake & Company
Portland, Oregon—Link-Belt Co., Pacific Div.
Providence, R. I.—Congdon & Carpenter Co.
Quebec, Canada—H. Duchene
San Francisco, Calif.—Link-Belt Co., Pacific Div.
Seattle, Wash.—Link-Belt Co., Pacific Div.
Spokane, Wash.—Link-Belt Co., Pacific Div.
Toronto, Canada—Drummond, McCall & Co., Ltd.
Worcester, Mass.—Pratt & Inman

CUMBERLAND STEEL COMPANY

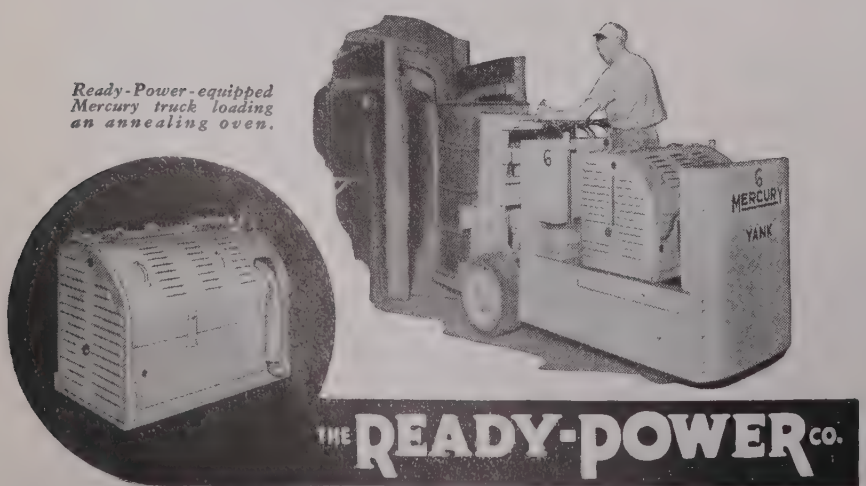
CUMBERLAND, MARYLAND, U. S. A.
ESTABLISHED 1845 INCORPORATED 1892

READY-POWER for smooth operation



Ready-Power-equipped, rubber-mounted Elwell-Parker moving green sand cores.

If it's smooth, electric truck operation you want, there's nothing better than Ready-Power gas-electric Power Units. Ready-Power offers *more* than regular electric truck operation because dependable electric current is generated right on the truck chassis in unlimited amounts. That means trucks are always ready to operate at top efficiency . . . 'round the clock if necessary. Install Ready-Power Units on any make electric truck. Write for details.



Ready-Power-equipped Mercury truck loading an annealing oven.

THE READY-POWER CO.

3822 Grand River Ave., Detroit 8, Michigan

PERSONALS

• **Edwin M. Shultes III,** has been named counsel for the chemical department of the General Electric Co., Pittsfield, Mass., succeeding **A. Cohen** who will continue as patent counsel for the chemical department with headquarters in Schenectady. Mr. Shultes has been associated with GE since 1945 and in 1947 joined the appliance and merchandise department.

• **Joseph H. Lambrix** has been named director of purchases for the Electric Auto-Lite Co., Toledo. Mr. Lambrix has been associated with Auto-Lite since 1923.

• **Leonard P. Fuller, Jr.** and **Richard H. Krueger** have been appointed district representatives in California of the Hertner Electric Co., Cleveland.

• **Frank J. Kennedy,** manager of the engineering department at the Ambridge, Pa. plant of the National Electric Products Corp., Pittsburgh, has been elected a vice-president of the corporation.

• **John B. Girdler,** assistant general manager of sales of the Vanadium Corp. of America, has been appointed to fill the vacancy in Pittsburgh occasioned by the recent death of G. A. Fritschi. **Raymond H. Filsinger, Jr.** has been appointed eastern sales representative of the corporation in New York.

• **B. O. Beck** has been appointed manager, range section, Crosley Div., Avco Mfg. Corp., Cincinnati, succeeding **Philip W. Pugh,** who has resigned to become sales manager of Modern Distributing Co. Mr. Beck has been with Crosley since 1946 as electric range engineer. **W. R. Crawford** replaces Mr. Beck.

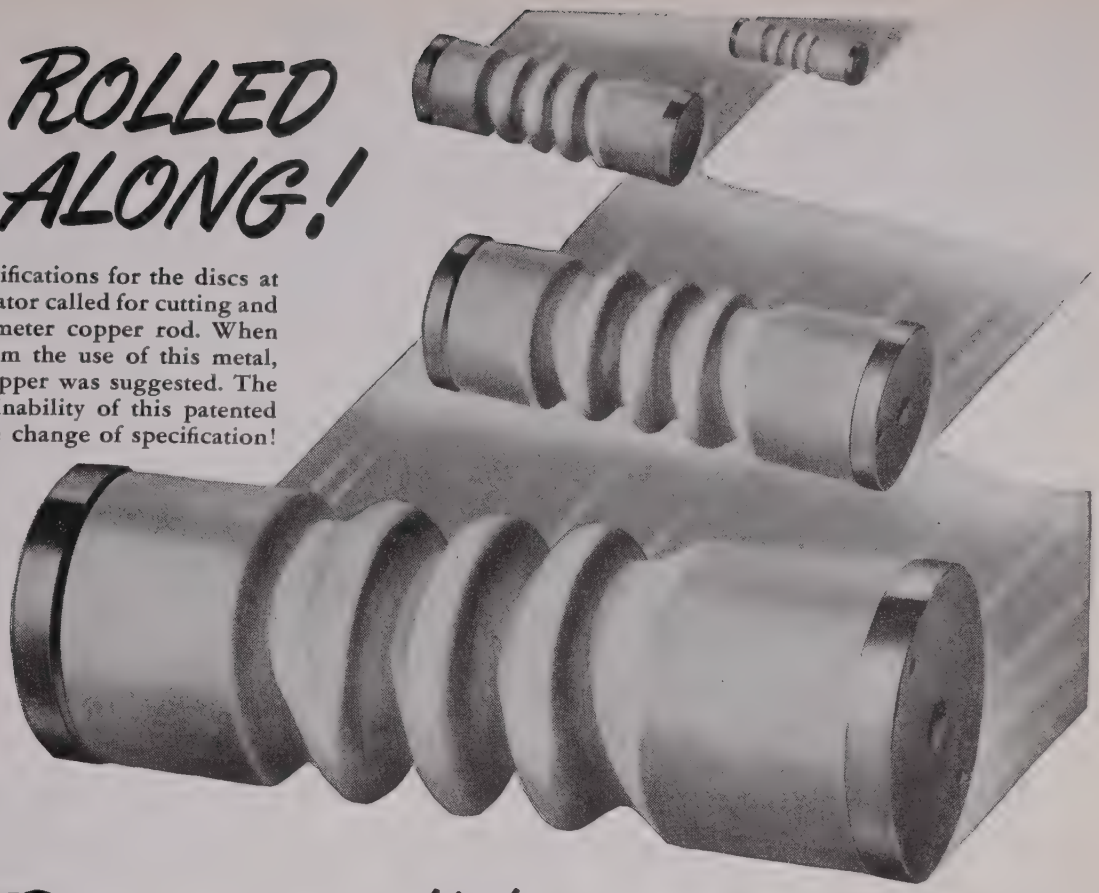
• **John C. McPherson** has been elected a vice-president of International Business Machines Corp., New York. He was previously manager of patent research and development.

• **Harry E. Madsen** has been named to the Chicago district sales staff of Ceco Steel Products Corp. Mr. Madsen has been associated with Detroit Steel Products for the past 20 years, prior to his coming to Ceco.

• **Donald P. Hess** has been elected to the board of directors and has been made chairman of the executive committee of Hungerford Plastics Corp., Murray Hill, N. J. Mr. Hess is president of the American Bosch Corp.

..THEN THEY *ROLLED ALONG!*

THE original specifications for the discs at the ends of insulator called for cutting and machining 2½" diameter copper rod. When difficulties arose from the use of this metal, Chase *Tellurium* Copper was suggested. The extraordinary machinability of this patented alloy resulted in the change of specification!



SPEED YOUR PRODUCTION *MAKE* A BETTER PRODUCT with

CHASE TELLURIUM COPPER ROD

GET ALL THREE!

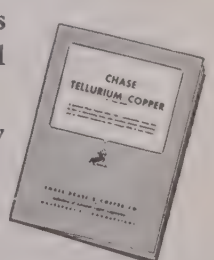
1. Machinability—Close to that of free-cutting brass! Eliminates bottleneck of producing parts from tough machining copper.

2. Forgeability—Hot-forges readily—has no adverse effect upon the hot working properties of copper.

3. Conductivity—Electrical: averages 90% of pure copper! Far surpasses any of the free-cutting brasses! Excellent thermal conductivity.

IN the instance noted above, this Chase-developed and patented alloy saved precious time—actually produced a better product! This kind of performance has been repeated time and again. That's why we recommend looking into the properties and advantages of Chase Tellurium Copper.*

Your production, too, can probably benefit from the extraordinary machinability of this new metal—from its excellent electrical and thermal conductivity.



Send for descriptive booklet today and get the complete story.

*U. S. Pat. No. 2,027,807

Chase

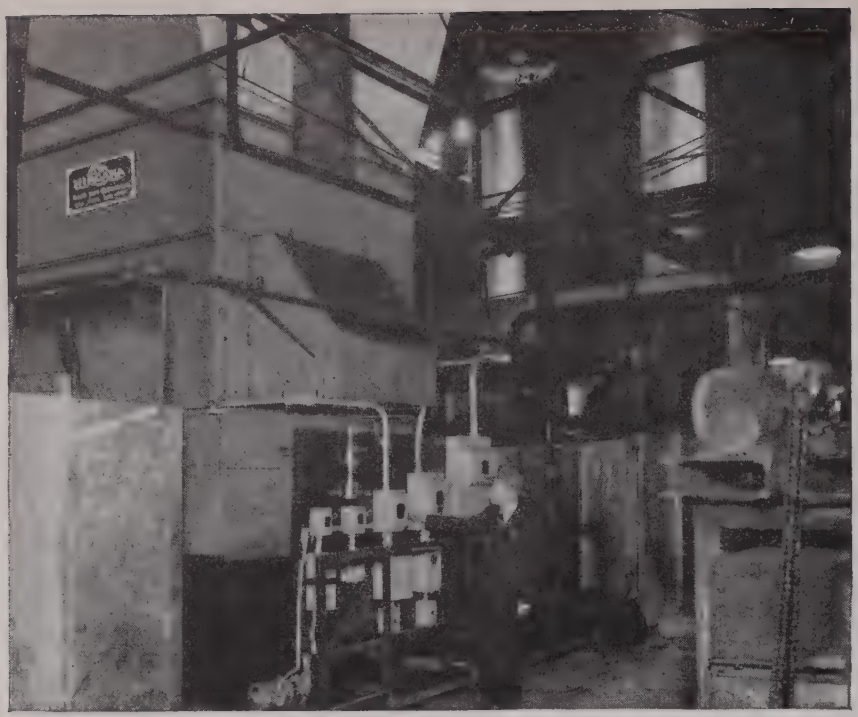
the Nation's Headquarters for
BRASS & COPPER

WATERBURY 91, CONNECTICUT

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

THIS IS THE CHASE NETWORK . . . *handiest way to buy brass*

ALBANY† ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT HOUSTON† INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE [illegible]
NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER† SAN FRANCISCO SEATTLE ST. LOUIS WATERBURY (†indicates Sales [illegible] Only)



Uniformly Better Results in Heat Treating...

● Using the NIAGARA AERO HEAT EXCHANGER to cool quenching bath solutions returns the cost of the equipment quickly and gives a bonus in fewer troubles for the heat treating superintendent.

Controlling the temperature of the quench means a uniform product...fewer rejections. Ample cooling capacity independent of water supply eliminates shut-downs because of hot oil. The heat is transferred from the oil to air by the evaporation of a water spray. Only the water evaporated is used and 95% of the water cost is saved.

In hundreds of installations, quenching both small parts and large shapes, production has increased at lower cost. Units operate reliably for years without maintenance troubles in plants that run 24 hours per day.

Niagara Aero Heat Exchangers also give extra value in cooling jacket water for process equipment or engines, hydraulic equipment, electronic sets, controlled atmosphere processes, and many other applications.

Write for Bulletin No. 96 - IA

NIAGARA BLOWER COMPANY

Over 30 Years Service in Industrial Air Engineering

405 Lexington Ave. New York 17, N. Y.

District Engineers in Principal Cities

INDUSTRIAL COOLING HEATING • DRYING

NIAGARA

HUMIDIFYING • AIR ENGINEERING EQUIPMENT

OIT Suspends License Privileges to Ascher

Washington

• • • **The Office** of International Trade has thrown its book at R. A. Ascher, New York exporter, who figured in the gray market hearings held by the Martin subcommittee of the Senate Small Business Committee. Hearings were held in New York last December on charges that Ascher had made alterations in export licenses issued by the OIT.

In addition to suspension of licensing privileges until Mar. 1, 1949, the OIT Compliance Commissioner directed that such privileges should be refused or revoked for any firm with which Ascher should become associated either through acquisition of "substantial interest" or a "position of trust" for the same period.

Specific charges were that five licenses authorizing export of 50 tons of steel had been raised to totals amounting to 1133 tons.

If licensing is still required after Mar. 1, 1949, the defendant may apply for lifting or modification of the order.

Tool Men to Be Given First Sales Refresher Course at Cornell

Cleveland

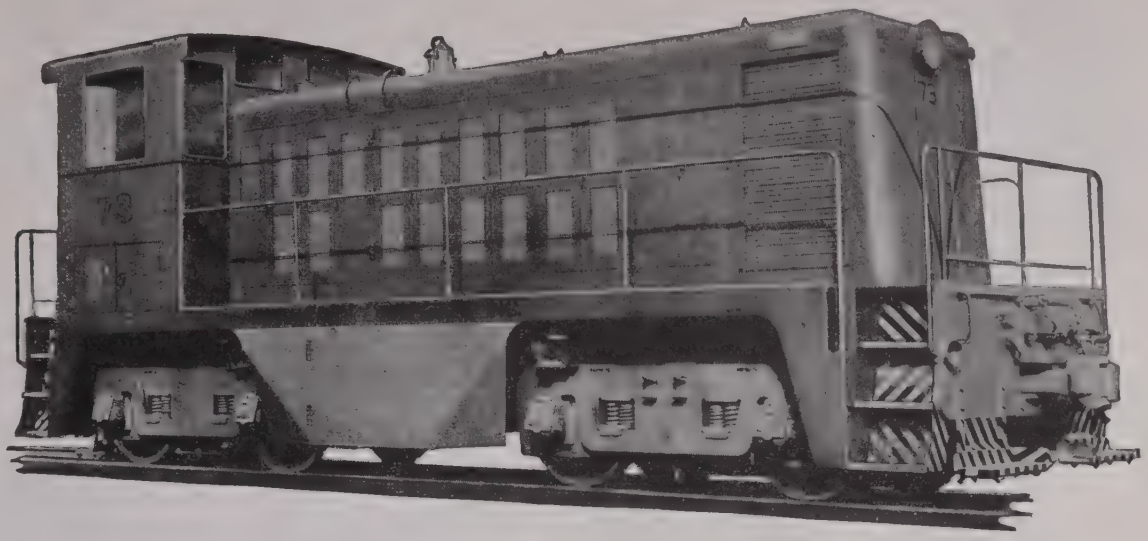
• • • **Fifty-eight** men, representing as many machine tool companies, will go back to college for the industry's first summer sales refresher course at Cornell University, Ithaca, N. Y., July 12-23.

These selected men, members of National Machine Tool Builders' Assn. or of American Machine Tool Distributors' Assn., range from president and sales manager through sales engineers. Many are veterans of many years in the field.

The course will be conducted by Sibley School of Mechanical Engineering at Cornell University, in cooperation with the two trade associations. It will be directed by Harry J. Loberg, professor in the Dept. of Industrial Engineering.

The faculty will include six members of the Cornell University faculty, nine experts from the major companies which use machine tools and 27 men from the industry itself.

Emphasis of the course and its



YOU GET "LAGNIAPPE" WITH YOUR NEW WHITCOMB

"LAGNIAPPE" is a Creole word used colloquially in Louisiana. It means "a little something extra." It is used here because it so aptly describes the characteristics of Whitcomb locomotives that are not visible. This something extra you get with every Whitcomb Diesel mechanical or Diesel electric locomotive is really something worth considering. For instance: Whitcomb locomotives are powerful enough to perform their given assignments—plus a little extra power. They do their jobs efficiently—and a little better. All the parts are instantly accessible for quick maintenance—and even sooner. They are durable for years of service—plus a few more years.

There is only one thing about a Whitcomb that cannot give extra service: that is its availability—it is available only 24 hours in each day.

Diesel Electric and Diesel Mechanical locomotives to 95 tons.

BLW THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

OUT OUR WAY
SO YOU FERGOT TO PUT DOWN SOL-SPEEDI-DRI, EH? MEBBE IF YOU BREAK A LEG, OR YOUR NECK, OR SUMPIN, YOU'LL REMEMBER! JEST LISTEN TO SOME OF TH' OLD-TIMERS AROUND HERE-- THEY'LL TELL YOU IT AIN'T HEALTHY TO FERGET TO PUT DOWN SOL-SPEEDI-DRI!
THAT KID BETTER KEEP ON HIS TOES! BUT BEFORE HE CAN DO THAT, HE'S GOTTA PUT DOWN SOL-SPEEDI-DRI SO HE CAN KEEP ON HIS FEET!
REMEMBERIN' AIN'T ENOUGH! IT'S REMEMBERIN' NOT TO FERGET THAT'S IMPORTANT!
J.R.WILLIAMS
THE LECTURE
COPR. 1948 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

Remember the Name . . . SOL-SPEEDI-DRI!

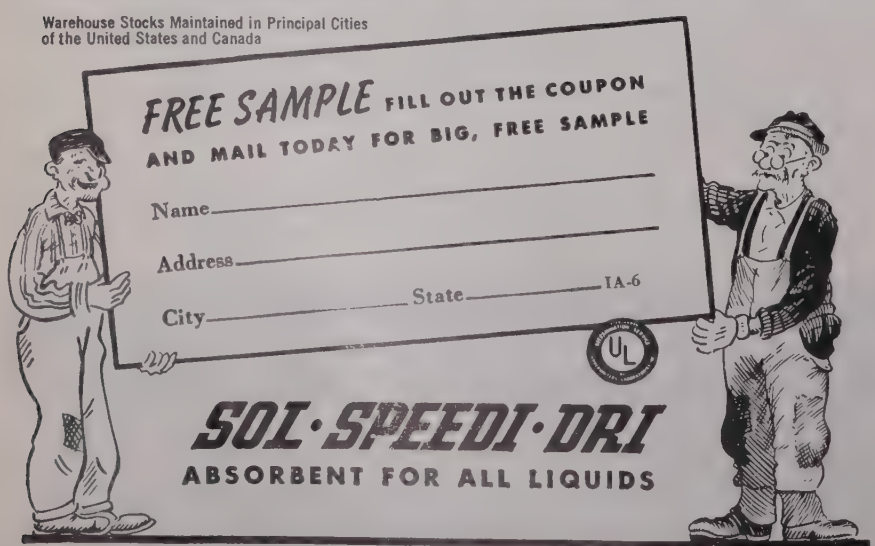
More SOL-SPEEDI-DRI is used in America's busy shops and plants than any other product of similar nature. Industry has learned that it can count on the unvarying quality of SOL-SPEEDI-DRI . . . the original and foremost absorbent for all liquids. It is this quality that assures you cleaner, brighter, safer floors . . . freedom from slips and falls caused by oil- and grease-soaked surfaces. In addition, SOL-SPEEDI-DRI costs *less* per pound because it does *more* work . . . because it is always efficient, always dependable.

SOL-SPEEDI-DRI is obtained by selective mining, is laboratory-checked hourly, and is processed by the most modern methods and equipment. It is packed in special moisture-proof bags, assuring maximum absorption at the time of application. Don't take chances . . . say SOL-SPEEDI-DRI, and be safe!

WHEN YOU BUY, BE *SURE* IT'S SOL-SPEEDI-DRI!

Safety and Maintenance Co., Inc., No. 1 Wall St., New York 5, N.Y.

Warehouse Stocks Maintained in Principal Cities of the United States and Canada



47 lectures and presentations, will be on the sale of capital equipment. It is the first such course to be offered by a college and is a part of the vigorous program planned for 1948 by the National Machine Tool Builders' Assn., under its new president, A. G. Bryant, vice-president, Cleereman Machine Tool Co., Chicago.

Outlines Three-Point Program for Better Preparation of Scrap

Cleveland

• • • **Better preparation** of scrap was urged recently by Leonard Abrams, Atlas Steel & Supply Co., and chairman of the local scrap dealers' committee, Institute of Scrap Iron & Steel, following a meeting with scrap buyers for the major steel mills in this area.

Louis Miller, vice-president, Columbia Iron & Metal Co., chairman of the local scrap brokers' committee, and Jack Levand, Luria Brothers & Co., Inc., and president, Northern Ohio Chapter, Institute of Scrap Iron & Steel, who also attended the meeting, backed up Mr. Abrams' three-point program for the preparation of scrap calling for:

(1) Preparation of No. 2 steel 3 ft and under instead of 5 ft and under.

(2) More careful preparation and elimination of nonferrous materials.

(3) Complete segregation of tin can bundles, to be designated as such, and not included in other grades.

The meeting of scrap industry representatives and mill buyers is the result of the problem mills are having in charging some of the material. One major consumer in this area in consuming 120,000 lbs of scrap was forced to use 200 charging boxes, whereas bloom butts, it was pointed out, would have required only 30 boxes. This, however, was an extreme case.

Adds to Transformer Shop

Pittsburgh

• • • **Westinghouse Electric** Corp. will boost production of large power transformers by building a 92,000-sq ft addition to its Sharon plant according to a recent announcement by John K. Hodnette, Westing-

No Substitute for Quality

There is no substitute for Quality—therefore no substitute for Bunting Bronze.

When you need Bearing Bronze, Quality Bearing Bronze, call the leading Distributor in your community—because—the leading Distributor in your community is, almost certainly, the Bunting Distributor. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Branches in Principal Cities.

Bunting

BRONZE BEARINGS

PRECISION BRONZE BARS

BUSHINGS

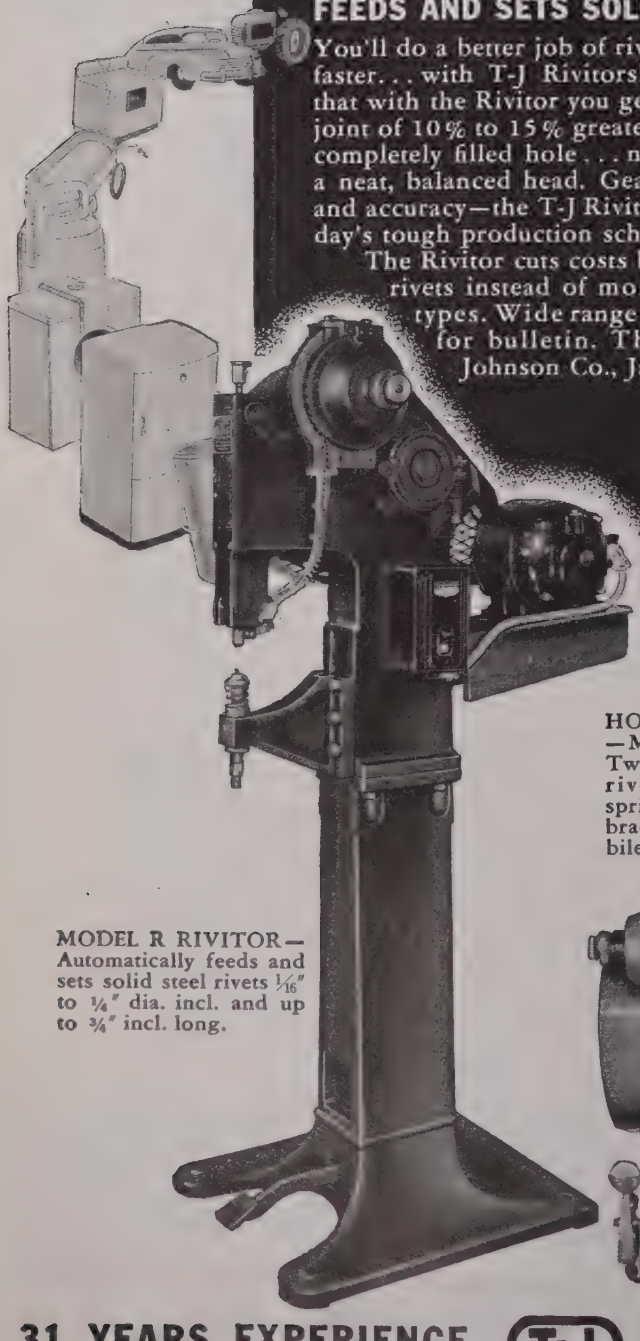
Save RIVET-SETTING *Time!* ... CUT COSTS with

T-J *Rivitors*

AUTOMATICALLY
FEEDS AND SETS SOLID RIVETS!

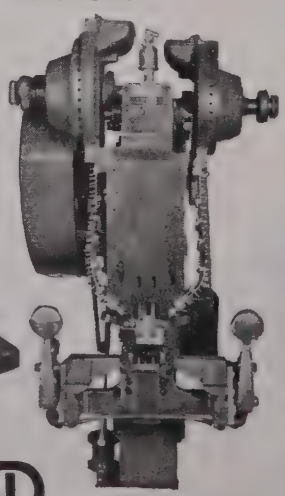
You'll do a better job of rivet setting . . . faster . . . with T-J Rivitors! Tests show that with the Rivitor you get a solid rivet joint of 10% to 15% greater strength—a completely filled hole . . . no flashing . . . a neat, balanced head. Geared to speed and accuracy—the T-J Rivitor fits into today's tough production schedules.

The Rivitor cuts costs by using solid rivets instead of more expensive types. Wide range of uses. Write for bulletin. The Tomkins-Johnson Co., Jackson, Mich.



MODEL R RIVITOR—Automatically feeds and sets solid steel rivets 1/16" to 1/4" dia. incl. and up to 3/4" incl. long.

HORN BRACKETS—Model RR 1221 Twin Rivitor used for riveting flat steel springs to mounting brackets for automobile horns.



31 YEARS EXPERIENCE T-J

TOMKINS-JOHNSON RIVITORS

house vice-president and manager of the company's transformer division. Ground has already been broken for a new shop in which the transformer tanks will be fabricated. Approximately 400 additional workers will be needed when the building is completed sometime after the first of next year bringing the total employment at the Sharon works to more than 8000.

Washington

• • • **The Securities and Exchange Commission** estimates the net working capital of U. S. corporations at $61.8 billion as of December 31, 1947. SEC says the total represents an increase of $5.3 billion during the year—an increase resulting from a rise of $12.4 billion in current assets but offset in part by a rise of $7.1 billion in current liabilities.

Manufacturing and trade companies in 1947 accounted for practically the entire increase in net working capital and manufacturing companies accounted for about four-fifths of the increase. Railroads and electric and gas utilities showed small declines, while communication, mining and other companies showed small increases.

Washington

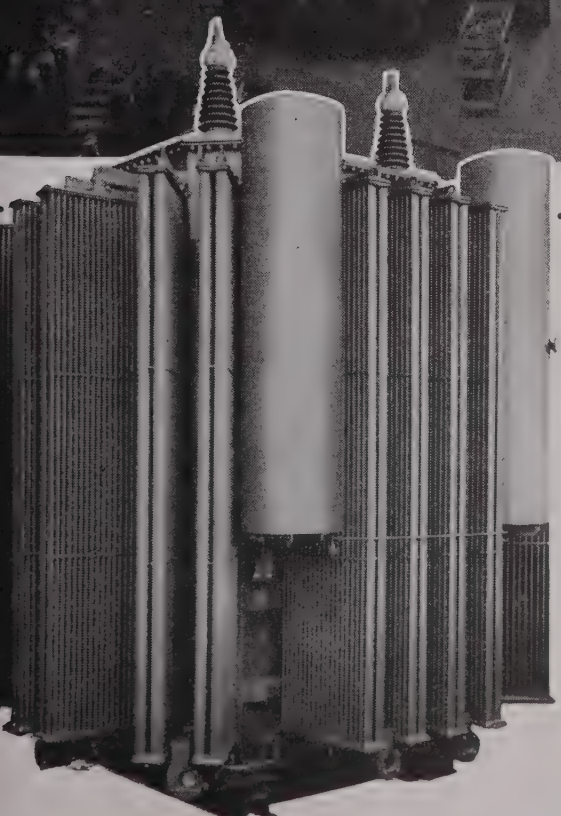
• • • **Ohio Fuel Gas Co.** of Columbus has been granted authorization by the Federal Power Commission to construct a 97-mile transmission pipeline between Licking and Allen counties. Cost of the project is estimated at $2,986,000 but this may be reduced by salvaging some lines which will be replaced.

The FPC also has granted temporary authorization to Texas Eastern Transmission Corp. to construct an additional compressor station facilities on the Big and Little Inch pipeline. The estimated cost of the new facilities is slightly more than $10 million.

Washington

• • • **Both construction activity** and production of building materials have registered an upswing, according to preliminary figures compiled by the Office of Domestic Commerce.

Physical volume of the 20 materials in the Commerce Dept. index



20,000-kva self-cooled and 25,000-kva forced-air-cooled transformer, typical of Wagner design and manufacture.

"Built by Wagner" means - it's dependable!

Wagner, a pioneer in the development of transformers, has the experience, background, and facilities to build transformers for every need. Wagner transformers have been known for their dependability for over fifty years. During this time they have established a reputation for excellent performance in electric power systems throughout the country.

Wagner Transformers are dependable because they are liberally designed with extra factors of safety, constructed of carefully selected materials, and are skillfully engineered, built and tested in Wagner's transformer shops.

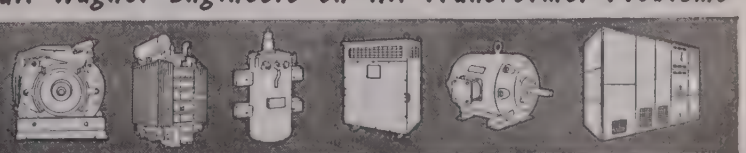
Users of power transformers will find it to their advantage to consult Wagner on their next transformer installation. Users of Wagner transformers also profit by our quick, convenient, nationwide service facilities. Twenty-nine branch offices, located in principal cities and manned by trained field engineers, are ready to serve you. Write for Bulletins TU-180 and TU-181 for information on the complete line of Wagner Transformers.

Wagner Electric Corporation

6403 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.

Consult Wagner Engineers on All Transformer Problems

Wagner Electric Corporation EST. WE 1891



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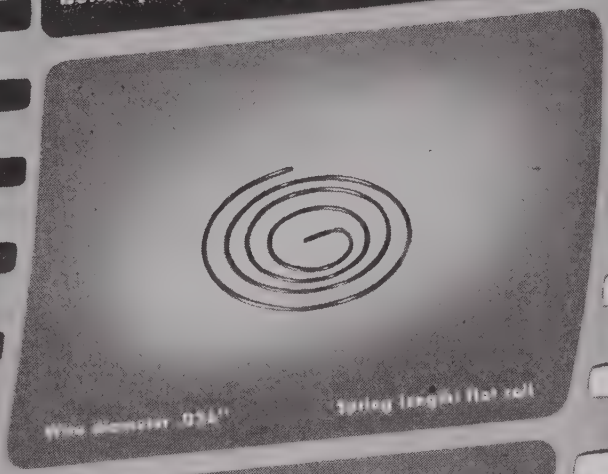
ELECTRICAL AND AUTOMOTIVE PRODUCTS

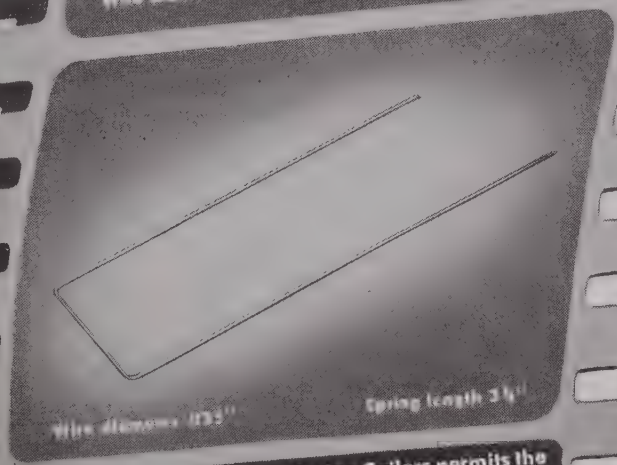
748-4

No. 16 in a series

SPRING SCENES by TORRINGTON . . .

showing how skilled springmakers using Torrington Spring Coilers help industry make better products . . . faster and cheaper.





The design of Torrington Spring Coilers permits the professional springmaker full use of his talents in the development of springs. There is practically an unlimited range of spring designs that can be coiled with accuracy . . . high speed . . . and economy with Torrington Coilers. Simple adjustments minimize set-up problems. Above springs were made on Model W-11. Various attachments and thirteen other models are available. Wire diameters range from .003" to .750". Write for catalog.

THE TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

rose on an average of 15 pct i March. Shipments of reinforcin bars were up 18 pct and fabricate structural steel rose 15 pct.

April preliminary contructio figures are $100 million above Marc and $300 million above Februar Total construction activity for th first four months amounts to abou $4.6 billion.

An estimated 90,000 housing unit were started in April to bring th four-month total to about 257,00 as compared with 205,000 last yea

With a few exceptions, expor of construction materials for th first quarter showed a marked de cline over the same period las year. Included in the decline wer all major classifications of iro and steel items except rigid ste conduit.

Dallas Suggests U.S. Start Stockpiling Brass Scrap Now

New York

• • • **The stockpiling** of bra scrap was recommended last wee to the subcommittee on mines an mining of the House Committee o Public Lands by C. Donald Dalla chairman, Revere Copper an Brass, Inc.

In a letter addressed to subcom mittee chairman William Lemk Mr. Dallas pointed out that th copper deficits in 1947 and 194 were met through imports mad possible by the suspension of th import tax of 4¢ per lb on coppe estimated to result in savings t consumers of $300 million per yea

As to whether or not we hav enough copper, if incentive is give to provide our own domestic use in cluding that of the Army and Nav Mr. Dallas said "In 1947 our domes tic production fell far short of ou current needs. During the first months the government release about 120,000 tons of its own coppe and the total imports aggregate approximately 400,000 tons. Do mestic production in 1947 totale approximately 870,000 tons. Ther is a deficit of approximately 500,00 tons per year at the current rat of industrial consumption whic can be met only through import Even were we to subsidize the pro duction of copper by margina mines, it is unlikely that they coul yield over 10 pct of this defic amount. The present price is 21½ a pound, which certainly is a tre

FROM TOOLMAKING THROUGH ACTUAL PRODUCTION...

Here's Real Help that reduces costs!

HELP IN TOOL STEEL SELECTION!

The Carpenter Matched Set Method of Tool Steel Selection enables you to quickly choose the right steel for best results on each tooling job. Just by following the arrows on the Matched Set Diagram, you can determine exactly which steel to pick for extra wear resistance, greater toughness, hardening accuracy and safety, etc.

HELP THAT SIMPLIFIES HEAT TREATING!

The heat treatment of Carpenter Matched Tool and Die Steels has been simplified beyond anything previously known. Instead of "guessing" about important items such as speed of heating, furnace atmosphere, time for drawing, etc.—you can be sure of getting the results you want with the help of complete and practical working data.

HELP TO INCREASE TOOL LIFE!

If the tools and dies you are using fail to give you the performance you want, the Carpenter Matched Set Method enables you to arrive more quickly at the one steel most likely to boost output per grind and reduce tool failures.

AND YOU CAN GET IMMEDIATE DELIVERY FROM STOCK! ...CALL YOUR CARPENTER WAREHOUSE OR DISTRIBUTOR

Atlanta • Baltimore • Birmingham, Ala. • Boston • Bridgeport, Conn. • Buffalo • Chicago • Cincinnati • Cleveland • Dayton • Detroit • Grand Rapids, Mich. • Hartford • Houston • Indianapolis • Kansas City • Los Angeles • New York • Philadelphia • Providence • St. Louis • Worcester, Mass. • *In Canada:* Toronto • Montreal

And you get many more advantages when you use the Carpenter Matched Set Method. With far fewer steels to "work with," inventories are reduced and chances of tool steel "mix-ups" are fewer. Put this cost-reducing program to work in your plant, now. Ask for your copy of the new Carpenter Matched Tool Steel Manual. Its 189 pages of selection and heat treating data are your starting point for real savings. Just contact your Carpenter representative.

The Carpenter Steel Co., 121 West Bern St., Reading, Pa.

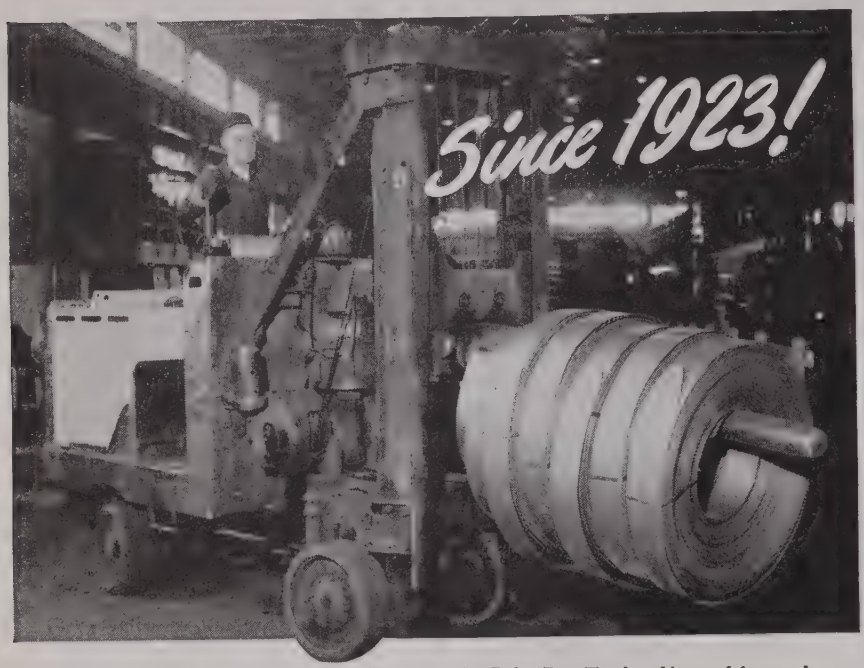
Carpenter

The Standard Tool Steels of Industry

MATCHED TOOL & DIE STEELS

★ ★

One BAKER TRUCK has handled OVER 4,000,000 TONS OF STEEL

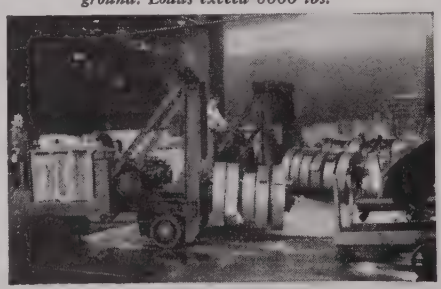


Baker Ram Truck, 25 years old, handling 6600 lbs. of coiled strip—with operator who has been on the job as long as the truck.

On February 13, 1923, the first ram truck ever built for handling coiled strip went into service for a large steel mill in Ohio. Since then, this Baker Truck has been operating continuously—usually 24 hours per day. For 25 years it has been on the same job, taking coiled steel from the hot strip mill to storage. As of January 1, 1948, this truck had handled 4,080,297 tons of steel *and is still going strong!*

This truck, the forerunner of modern Fork, Ram and Hy-Lift Trucks, performed so well that five more like it were purchased during the next two years. These, too, have given continuous service—24 hours per day—and are still on the identical jobs for which they were purchased a quarter of a century ago. It is conservatively estimated that these six trucks have handled a total of over 16,000,000 tons of steel—averaging only about one day per month out of service for maintenance.

Two Baker Ram Trucks taking steel from end of hot strip mill. Original truck in foreground. Loads exceed 6000 lbs.



More recently this mill has purchased several modern Baker Ram trucks—like this 12,000 lb. model handling coils from end of welding line.

Let a Baker Material Handling Engineer demonstrate how records like this can be made in your plant.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Co.*
2175 West 25th Street • Cleveland 13, Ohio
In Canada: Railway and Power Engineering Corporation, Limited

Baker INDUSTRIAL TRUCKS

mendous incentive, and the payment of subsidy prices above that figure could bring out very little extra copper.

"Naturally the exact figures on Army and Navy stockpiling are not available to us. Army and Navy use of copper should increase in view of the rearmament program. To the extent of Army-Navy stockpiling and Army and Navy use, whatever the actual figures may be, the needs will have to be met from imports.

"For a large part of the copper produced in the United States the costs are no more, and in some instances even less, than production costs abroad. Modern equipment and mining techniques give our people great assistance, too. The real point, after all is said and done, is that where our nation is in short supply of an essential commodity like copper which can be supplied from abroad, we should do whatever we possibly can to get that copper here. Our national defense requirements alone demonstrate the practicality of this observation. Some people talk about stockpiling one million tons of copper, some six million tons. Certainly it is the fact that copper requirements of each succeeding war seem to be greater, indeed the consumption of copper during the last war was far greater than any of us anticipated. We used about one and a half million tons of copper per year during the war, and it certainly would be dangerous to discount this amount for the future, indeed we may need as much as 50 pct more copper in the next emergency than we can produce, even with civilian use cut to the minimum.

"Therefore, we should take steps to remelt any surplus brass scrap which we can lay our hands on and put it away in billet form as a brass scrap pile. Naturally, any of us would prefer to have a stockpile of virgin copper and virgin zinc, but we may have to wait years for such ideal stockpiles to materialize. We certainly could at once commence remelting a brass stockpile which would be found of very great value to our nation for defense purposes."

Scrap Institute Will Meet July 26 and 27

Washington

• • • **The midyear meeting of the**

Valuable records gathered over the years—

can be destroyed in minutes—

protect them against fire-damage and water-soaking . . .

THE *Kidde* WAY!

Documents, drawings, correspondence, accounts receivable—these vital records could be quickly destroyed. A fire that wrecks your vaults might wreck your business too!

For a record-vault fire, a hose-stream's no help. A water-soaked wad of papers is as useless to you as a charred mass! BUT a *Kidde** Record Vault System can extinguish the flames quickly—*without* any water damage.

A *Kidde* System discharges dry, clean carbon dioxide (CO_2) that quickly fills the vault from floor to ceiling—to attack fire at any level. The CO_2 can even penetrate closed cabinets—to fight fire inside!

The Freedom Train and the United Nations safeguard *their* documents the *Kidde* way—give *your* records the same protection! Ask a Kidde representative for full details.

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FIRE EXTINGUISHING EQUIPMENT
FIRE DETECTION DEVICES
HIGH-PRESSURE CONTAINERS
OIL RE-REFINERS AND FILTERS

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MANUFACTURING ENGINEERS

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Use the right blade

STAR

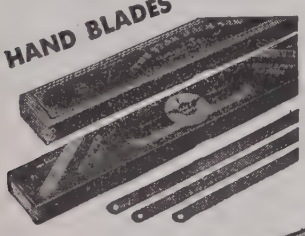
MAKES IT!

For the right saw for any given job, see the man who sells STAR Blades! Star makes blades for cutting everything a hack saw or band saw can cut —a *complete* line. Be sure! Tell your Star supplier the job you want to do. He'll tell you — quickly, expertly — what STAR Blade will do it best!

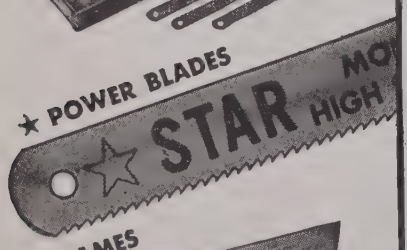
FREE BOOKLET OF HACK SAW HINTS. *Answers blade questions for you as they arise: what speed to use . . . coarse teeth or fine . . . what causes dulling . . . blade lengths . . . prices.*

Ask your Star supplier for your copy of "Metal Cutting." Helpful . . . free.

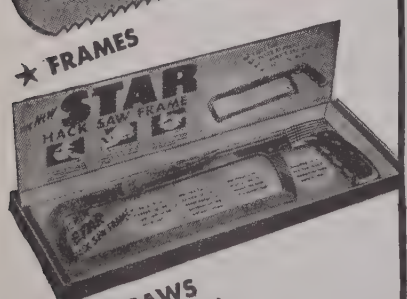
★ HAND BLADES



★ POWER BLADES

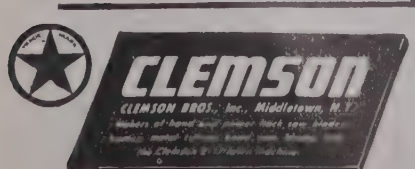


★ FRAMES



★ BAND SAWS (including skip-tooth)

1944



Institute of Scrap Iron & Steel Inc. will be held July 26 and 27 at the Ambassador Hotel, Atlantic City, N. J., it was announced by E. C. Barringer, executive vice-president of the institute.

The morning session will be devoted to a discussion of business conditions, and another to a meeting of the board of directors. A golf tournament is scheduled for both afternoons. A banquet the second evening will close the 2-day meeting.

Reservations for rooms at the Ambassador Hotel must be made through institute headquarters, 1344 Connecticut Ave., N. W., Washington 6.

Westinghouse Nets $800,000 Annually On Its Leftovers

Pittsburgh

• • • **Leftover steel** scraps, crating lumber, paper, paint, solvents and oils—the step children of industry—have netted the Westinghouse Electric Appliance Div. plant at Mansfield, Ohio, an annual savings of $800,000.

Typical of the annual savings, cited by Van Derau, works manager, are: 37,725 gal. of solvents, oils and thinners reclaimed and reprocessed; 60,000 gal, of primer and finish paints recovered; 5 million lb of odds and ends of sheet steel reclaimed for other uses; 250,000 board ft of lumber saved; 40,000 lb of cleaning rags, dust cloths, gloves and mops made reusable through laundering; and $29,000 in paper savings through baling and reuse.

The salvage operation was started in the Westinghouse plant 12 years ago in one room. Today it is literally an industry within an industry and occupies an entire building. In addition to salvaging the scrap material in the plant, the salvage department must also find out why it was scrapped and make recommendation for the elimination of waste at the source.

Sheet steel scraps are cut into usable shapes or punchings used in the manufacture of electric home appliances. Primer and finish paints that ordinarily would be lost are caught in a waterfall behind spray

Motor-operated

KINNEAR DOORS

respond with magic ease to push-button control

It's sheer magic the way you can shave manpower losses and plug profit drains at doorways with Kinnear Steel Rolling Doors. A split-second and mere fingertip pressure are all the time and effort needed to start or stop these doors equipped with rugged Kinnear Motor Operators. Any number of push-button stations can be placed at strategic points —at door jamb for on-the-spot operation and elsewhere for step-saving remote control. And any number of doors can be operated from a single station.

The prompt, glide-smooth door action is possible because the Kinnear *interlocking-slat* steel curtain *lifts vertically* and coils compactly above the lintel. Openings remain completely clear. All surrounding floor and wall space is usable. This tough, flexible, all-metal door protector withstands years of weather attacks; resists fire and theft. For a better check-rein on profit leaks in plant operation, rely on efficient, economical Kinnear Steel Rolling Doors. Built any size, for installation in old or new buildings. Write for more facts today.

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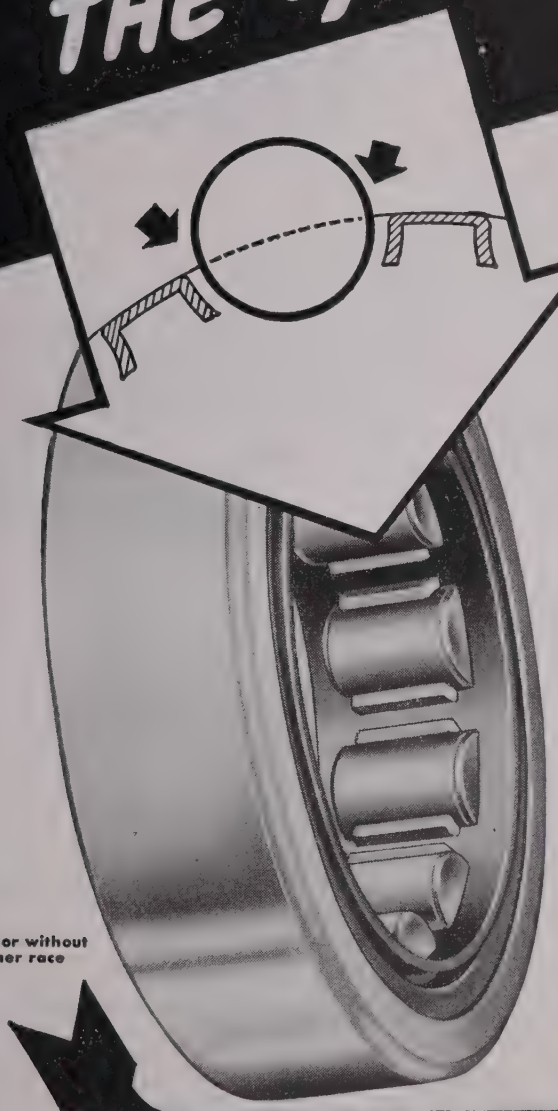
Saving Ways in Doorways

KINNEAR
ROLLING DOORS

THE "Guide Lip" DOES IT!



With or without inner race

Tru-Rol

ROLLWAY'S

New Steel-Retainer Bearing

The TRU-ROL bearing is an economical steel-retainer bearing, yet it maintains throughout its long life the *tru-rolling* which approximates the precision of ROLLWAY'S bronze-retainer type bearings.

Why the "Guide-Lip" Assures True Rolling

The newest, most advanced feature in steel-retainer design!

The guide-lips in the TRU-ROL bearing are concentric with the roller. These *curved* double flanges are deep and broad in the retainer pockets . . . they guide each roller in perfect alignment . . . convey a constant thin film of lubrication to every roller . . . and keep it there. As a result, TRU-ROL is longer-lasting and gives better performance throughout the life of the bearing.

Only TRU-ROL has "Guide-Lips"

MAIL THIS COUPON TODAY!

ROLLWAY

BEARING COMPANY, INC.

Syracuse, N. Y.

ROLLWAY BEARING CO., INC.
Syracuse, N. Y.

Gentlemen:
Please send me—free of charge—your new catalog with complete technical data on TRU-ROL BEARINGS.

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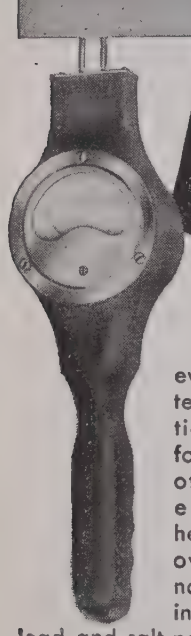
INSTANT, DIRECT
Temperature Readings
Accurate to within a
Fraction of a Scale
Division with

XACTEMP
Trade Mark Reg. U. S. Pat. Off.
HAND PYROMETERS



For All-around General Temperature Checking

Specify XACTEMP PYROMETERS wherever a quick, accurate temperature determination is needed. Used for surface temperatures of welds, welded rail ends, billets, slabs, heated rollers, forgings, ovens, hot plates, furnace walls—for general inspection in furnaces, lead and salt pots, galvanizing tanks, core ovens, type metal, etc. Long-life cast aluminum and brass construction. Medium resistance, fast-acting indicator, provided with Alnico V magnet—direct reading dial starts at 50° F. or 60° F. Simple, easy to operate—no adjustments necessary—always ready for use. Will take most types of thermocouples. A full line of thermocouples available from stock.

FOUR MODELS

Catalog No.	Range	Thermocouple
LT 800	60-800 F.	Iron-Constantan
LT 810	60-1200 F.	Iron-Constantan
LT 820	60-1600 F.	Iron-Constantan
LT 830	50-2500 F.	Chromel-Alumel

PRICE WITHOUT THERMOCOUPLE $39.50

Ask also about XACTEMP PYROMETERS for taking temperatures of molten non-ferrous metals

GORDON SERVICE

CLAUD S. GORDON CO.

Specialists for 33 Years in the Heat Treating and Temperature Control Field

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Dept. 16 • 7016 Euclid Avenue • Cleveland 3, Ohio

booths, rolled up like taffy and reworked into new paint. Oil is reclaimed from screw machine operations and is separated from other materials in it just as cream is separated from milk.

Raw Materials Cost Figures Show Increase Over 1936-39 Average

New York

• • • **Costs of** raw materials required by iron and steel companies averaged 15 to 461 pct higher on Mar. 1, 1948 than the average during 1936-1939, according to a recent analysis by American Iron & Steel Institute. Construction costs were 73 to 153 pct higher. Freight rates averaged 27 to 62 pct higher in nine classifications.

Results of the analysis emphasize the fact that steel companies, like every other concern, have had budgetary problems in trying to replenish stocks of goods with depreciated dollars, in trying to expand and in seeking to replace worn-out equipment at prices far above the amounts originally expended.

Of 28 raw materials the largest increase was 461 pct for palm oil, which is imported for use in the making of tinplate. Among the other increases were: Fuel oil, 175 pct; heavy melting scrap, 163 pct; purchased coal, 129 pct; ferromanganese, 64 pct; and zinc 117 pct.

Many of those increases mean very large amounts of money when multiplied by the large quantities purchased by the entire industry. As an illustration, the steel industry uses over 2 billion gal of fuel oil annually, and a 1¢-a-gal increase in fuel oil jumps steel's costs by $20 million annually. An increase of $5 a ton in the price of purchased scrap boosts the industry's costs by more than $100 million per year, based on last year's purchased tonnage.

Labor costs also have advanced sharply. The actual average earnings per hour by wage earners in iron and steel are as follows:

Year	1936 —	$0.668
"	1937 —	0.818
"	1938 —	0.830
"	1939 —	0.842
"	1947 —	1.513
January	1948 —	1.573

MORE and BETTER STAMPINGS with Strenes Metal
DRAWING AND FORMING DIES

You'll find this book interesting. Ask for it.

Having been brought up the hard way, some engineers and diemakers insist that drawing and forming dies *must* be made out of tool steel. Generally, however, the advantages of contour-cast dies are recognized.

Strenes Metal is an alloy with characteristics especially suitable for drawing and forming dies. Proof of this is found in hundreds of cases where *Strenes Metal* dies are delivering an extraordinary number of perfect stampings between redressings.

We'll be glad to give you the evidence. The information will show you how to reduce your costs considerably along with improving your product. Tell us what your drawing and forming operations are and we'll tell you honestly what *Strenes Metal* dies will do for you.

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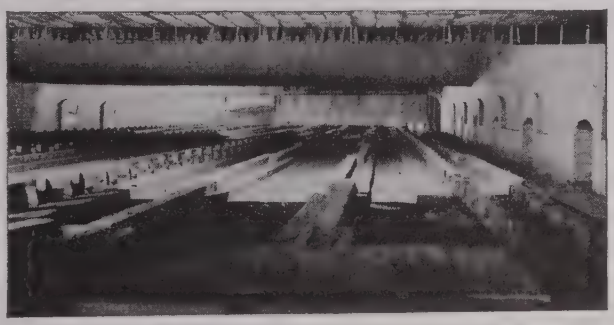
JUNE, 1948

R-S FURNACE FACTS

ISSUED MONTHLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH QUALITY HEATING OF METALS

Glamorgan has New R-S Furnace for Treatment of Cast Iron Pipe

The new R-S Furnace in the plant of the Glamorgan Pipe & Foundry Co. at Lynchburg, Virginia is used for annealing cast iron pipe made by the de Lavaud process. The furnace is oil-fired and equipped with temperature and furnace pressure control. 4" to 24" diameter pipe are rolled through the furnace on Carbofrax rails by chain-actuated heat-resistant alloy fingers. Maximum production is 20 tons per hour.



Upper picture shows the discharge end of the furnace with drive unit, blower, temperature control panel, and alloy fingers riding over sprockets at extreme left.

Lower picture of interior from charging end of the furnace shows Carbofrax skid-rails (offset in sections to provide for expansion), alloy chain fingers, and the curtain arch separating heating and cooling chambers.

In a heat-treat department in Florida
As the management's woes became torrider
The "super" decreed
"It's an R-S we need
Lest our maintenance charges grow horrider."

Time, though utterly irreplaceable, is in a large sense cheaper than most goods. Thus if X pounds of butter will last you Y days at a cost of Z dollars you know that butter enough to last 2 Y days will cost $2 Z.

It's different with Furnaces and the time during which they will give you maintenance-free service. If experience with numerous furnaces has convinced you that Maintenance Cost rears its ugly head at the end of X months and you have made up your mind that you won't stand for Maintenance before 2 X months you don't have to pay twice as much for a furnace to have your way.

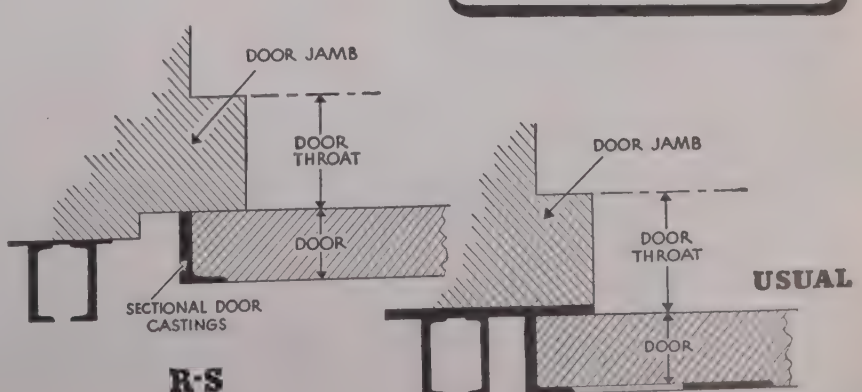
Sometimes you pay *just a little more* for an R-S Furnace. That little extra enables us to put in the apparently small details that give long life, high production, minimum maintenance. Many R-S Furnaces have run for years with little or no maintenance.

JMLeoP-M1

R-S Door Design Avoids Heat Waste

Plan drawings show comparison between R-S and the usual type of furnace door design. Conventional design superfluously supports the face of the brickwork with a cheek-casting which is directly exposed to interior furnace heat. This results in a transfer of heat to the door casting and the nearby buckstays. Warping develops and the door fails to close tightly.

R-S design eliminates the cheek-casting on the brickwork. The door, when clamped in the closed position, seats directly against the firebrick door-jambs. Firebrick tolerates heat so that the sealing of the door is always completely effective. Thus there is economy of heat, better heat control, better working conditions, and lower maintenance costs.



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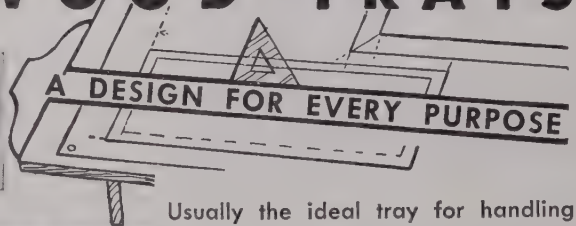

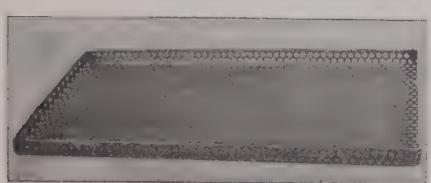

Usually the ideal tray for handling your work through processes is among the hundreds of designs available at Stanwood. If you require a new design for an unusual parts' handling problem, profit by Stanwood's extensive experience. Your Stanwood trays will be made of alloys that give maximum service life under your conditions. Size, shape and mesh will be right for rapid, economical work handling. Three Stanwood Trays are illustrated: 43. Stacking tray; ideal for handling small parts for assembly or heat treating. 33. Light weight alloy roller furnace tray for gears and similar parts; fully flexible. 113. Plain furnace tray for small parts; made in a variety of metals and perforations.

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Sees Domestic Mine Output and Imports Lead Shortage Aid

Sun Valley, Idaho

• • • **Domestic mine** production and imports were seen to be the most promising sources of additional lead production to meet unsatisfied demand for the metal by Robert L. Ziegfeld, secretary, Lead Industries Assn. at a recent meeting of the Idaho Mining Assn. Secondary lead recovery is not expected to increase beyond current scrap production as refiners' working stocks are very low. Secondary production should continue at 35,000 to 40,000 tons per month.

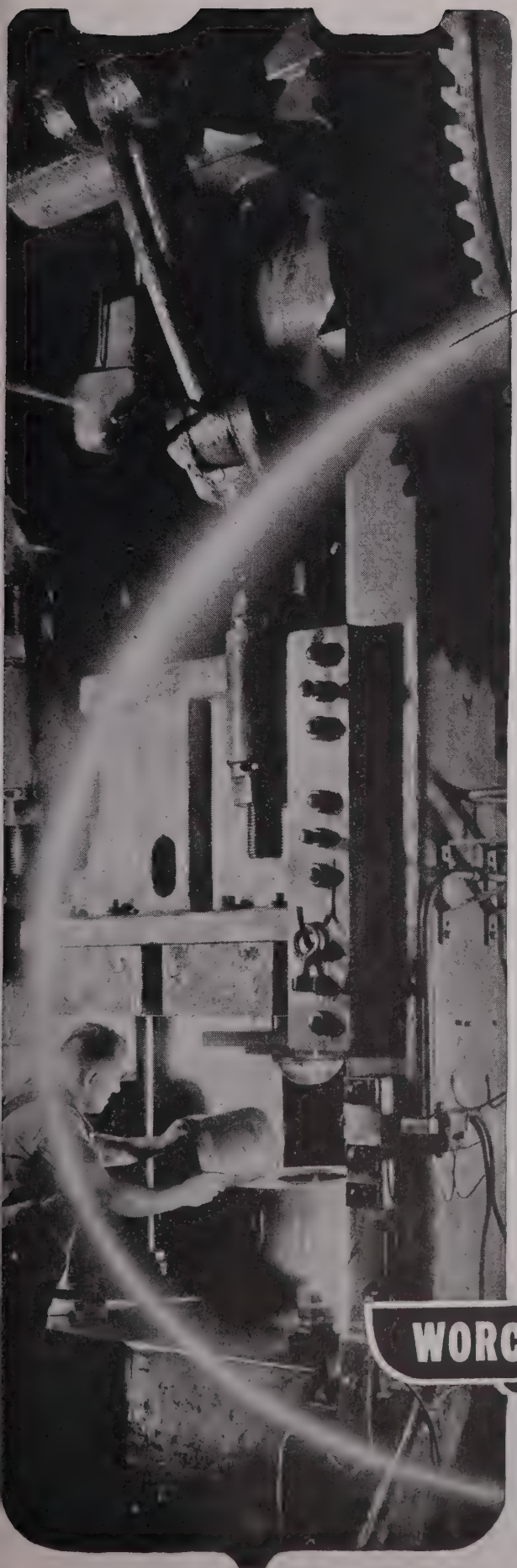
There appears to be little likelihood, Mr. Ziegfeld said, that the shortage of lead will be relieved so long as the current business boom lasts. But there are some developments which may alleviate it to some extent. These include gradually increasing mine production in this country and abroad, improved labor supply, recent settlement of the strikes in Mexico, and lessened demand as pent-up requirements are filled.

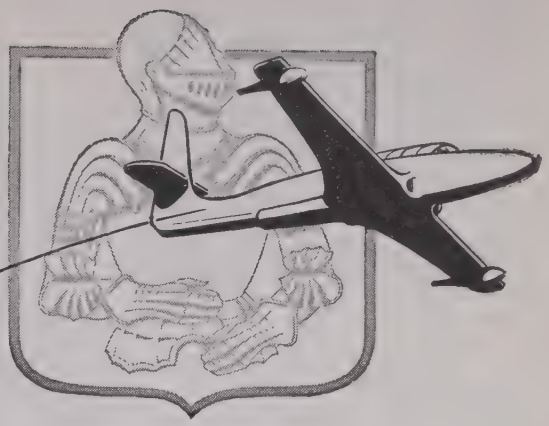
On the other hand, there are factors which may tend to operate in the opposite direction. Possible strikes, lower production from scrap, demands of the European recovery program and rearmament program might be listed among them.

Consumption during the first quarter of the year averaged about 98,000 tons a month. This compares with last year's average of about 100,000 tons a month. In neither case was demand fully satisfied, probably less so this year than last.

As to sources of supply of this lead, the mines of the United States have produced on the average about 34,000 tons a month since the first of the year. While domestic mine production does not equal the high of e few years ago, it has been constantly increasing since the 332,000 ton low of 1946. In 1947 it was 375,000 tons and this year is making a strong bid to hit 425,000 tons, barring unforeseen interruptions.

Imports in the same period averaged a little over 22,000 tons a month, somewhat better than last year's average. With secondary recovery currently at 40,000 tons, these three sources add up to between 96,000 and 97,000 tons of lead a month, the difference be-





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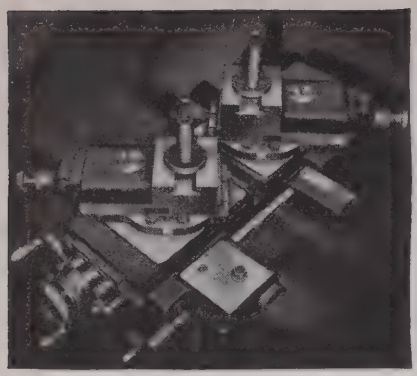

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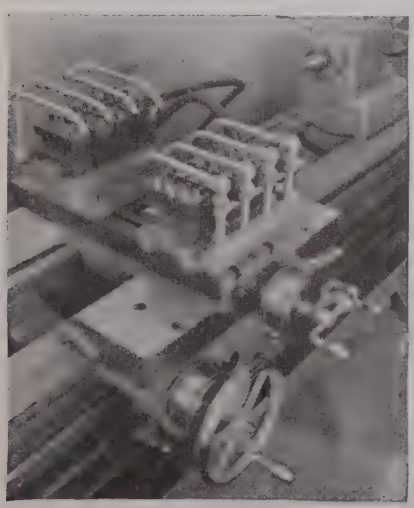
The LeBlond Rapid Production lathes, manufacturing machines for accurate, high speed production, are built in 13", 17", and 20" swing sizes. A number of optional headstocks provide the right speed-power combination for heavy stock removal on steel, or for obtaining mirror finish on non-ferrous metals.

The hundreds of variations designed by LeBlond for adaptation to difficult and exacting machining have speeded production and lowered costs for manufacturers all over the world. This experience is available for use in solving your metal working problems. For further information address the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.



(Advertisement)

tween that figure and the 98,000 ton consumption figure being accounted for largely by a small drop in refinery stocks of pig lead.

Some lines of consumption have already shown some slackening, but there are others that are hungry for whatever lead those lines don't need. Up to two months ago the storage battery industry had been consuming lead at an unheard-of rate. Now that rate of consumption has fallen way off but the cable industry and others are stepping in to take more lead.

It has been feared that the high price of lead would cause a substantial amount of substitution of other materials and that markets might thus be permanently endangered. That has not yet occurred to any great extent although there is considerable resistance in some lines. The reasons perhaps are that substitute materials in many instances are also scarce and that other prices are also high. That possibility must always be kept in mind, however.

Briefly, the situation today is that the time of balanced lead production and consumption is not yet in sight. The mining industry must do and is doing its utmost to increase production to preserve its markets. And consumers, who at the moment are faced with difficult problems of satisfying their needs, should realize that that situation will not exist permanently and that the mining industry is successfully expanding its production and through its own efforts and with its own money is adding to its reserves.

Navy Offering Iron Works on West Coast For Sale or Lease

Washington

• • • **The Navy's** Bureau of Yards and Docks is offering the largest iron works of its kind on the Pacific Coast for sale or lease. The Isaacson Iron Works located on East Marginal Way, in Seattle, is a complete forging and machine shop and electric ingot plant capable of processing metal all the way from scrap to a finished shaft.

Built in 1943 at a cost to the government of $4,106,000, the plant has two electromelt furnaces each with a rated capacity of 25 tons, as well as complete facilities for the production of heavy steel castings from

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In addition to these savings of steel, acid and money, *Oakite Pickle Controls* offer the following advantages:

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scrap steel and heating, forging, annealing, testing, machining, shipping, and related facilities necessary for the production of shafting from steel ingots.

The building saved the Navy considerable money during the war, especially in transportation costs, since scrap from the Pacific Coast could be completely processed nearby and the final product delivered on the West Coast.

Operated by the Isaacson concern during the war under a facilities contract with the Bureau, the plant is now in partial production. Ample electric power and light for all operations is obtained from the city of Seattle. The plant itself is a large irregularly shaped building completely equipped for the purposes mentioned.

Although the Navy Dept. does not own the underlying land, terms and conditions of its contract with the owner allow the Bureau to sublease or buy and sell the installation. Because it is a Naval industrial reserve plant, however, the iron works will be leased or sold with a recapture clause by which it can be taken back by the Navy in case of another emergency.

Colombia Authorizes Integrated Steel Mill In Highlands Area

By WALDEMAN BELLON

Bogota, Columbia

• • • **The Colombian** Congress has authorized the construction of a steel plant at Paz del Rio with an immediate capacity of 300 tons of pig iron a day, sheets, structurals, rails and wire products.

The future steelworks is to be located on the highlands in the heart of the country. The development of these highlands, including the capital, Bogota, has been hampered for decades by unfavorable transport conditions. When the plant is constructed this extensive sector of the industrial areas of Colombia can be supplied with steel products from Paz del Rio. Twenty-seven miles from the present terminal of the railway that runs from Bogota toward the northeast, the future steel works can be connected with the existing railway net which is being widened.

All raw materials for the production of steel are relatively near the site that has been chosen for the

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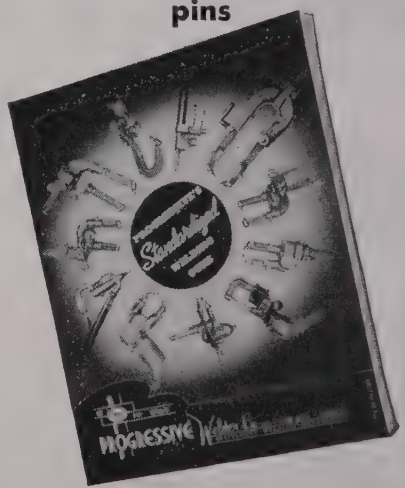

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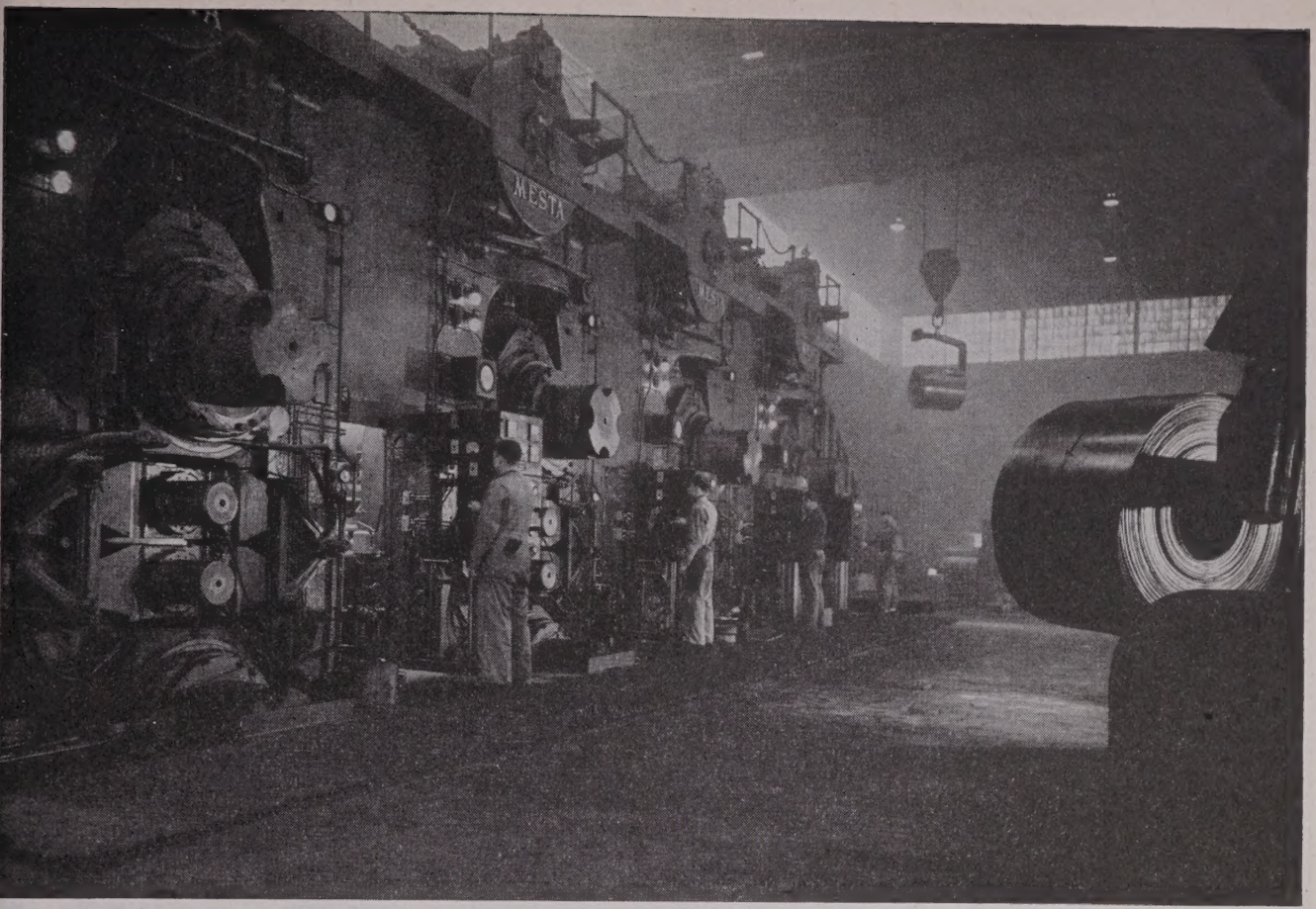

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S

——— NEWS OF INDUSTRY ———

works. Deposits of high quality iron ore are estimated at a minimum of 23 million tons after a preliminary survey of the area.

The ore can be worked in open cuts. Extensive limestone deposits are to be found within a distance of less than 140 miles, and coal deposits exist in adequate quantities in that part of the country. The surrounding mountains of the eastern Andes provide water power enough to supply the steelworks with electric energy. The construction of a hydroelectric power plant has already been started.

A capital of fifty million pesos. approximately $35 million, is immediately available for construction and every year this capital may be increased by another 20 million pesos. Until now 1½ million have been spent on studies and about the some amount on the land. What is needed at present most of all are technicians. In order to contract with them and, if possible, to sign up with a company specializing in the construction of such works, a delegation of the Institute for Industrial Development, which has been charged with the responsibility for getting the steel works started, has left for the United States and Europe.

The new undertaking meets great enthusiasm all over the country. Whether this will be sufficient to get the work started may, however, be rightly doubted. Several foreign groups of capitalists have been approached, but it seems that the conditions the government offered were not attractive enough. The participation of foreign capital and especially of foreign technicians is an important factor in the whole scheme, as only such help from outside can a successful venture be guaranteed. The Colombian, especially in the highlands, generally lack initiative. It has been observed that in the highlands less work is being done than in moderate altitudes of between three and five thousand feet. But Paz del Rio is situated at an altitude of 8500 feet.

In the second half of the last century there were iron works in Colombia which exploited local iron ore, converting it in a rather primitive way into pig iron. Many of the highly industrialized regions of Europe did not do any better a hundred years ago than those Colombian ironworks of La Pradera. But

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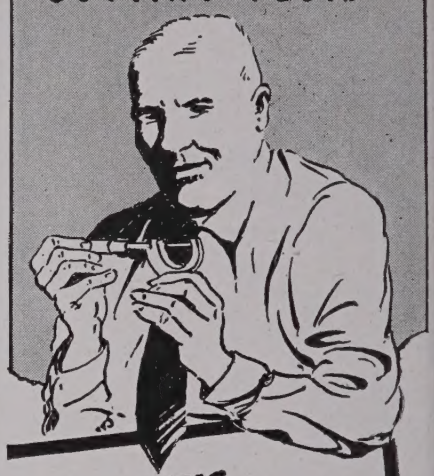

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while industrial development in Europe and the United States took a fast upward turn, Colombia industry was suddenly stopped by a series of civil wars which did not let the country come to peace for twenty years after 1885.

'47 Steel Wages Show Sharp Rise Against Profits and Dividends

New York

• • • **Steel companies** paid out almost $500 million more in wages and salaries last year than in 1946, the American Iron & Steel Institute reported recently. In contrast to that increase, the companies netted only $159 million more in profits than in 1946 and they paid out $36 million more in dividends. The comparisons are based upon reports from 52 steel companies accounting for approximately 92 pct of the industry's production of steel ingots.

During 1947 these companies paid out in dividends an average of 7.6¢ for each dollar in wages and salaries, compared with a 1946 ratio of 7.5¢ per dollar. But the 1947 showing was below the 9.9¢ per dollar paid in 1941, the 11.7¢ per dollar in 1940 and the 13.4¢ in 1937.

The earnings of these companies as a percentage of sales for 1947 averaged 6.3 pct, which was below the years 1936, 1937, 1940 and 1941. High actual earnings of $422,847,067 were based on record peacetime sales volume, in turn based upon record peacetime steel production.

Federal, state and local taxes paid out by the steel companies in 1947, at $428,625,403, exceeded their profits for the year. Dividend payments at $183,780,177 compared with the $147,354,487 paid in 1946.

The invested capital of these companies totaled $4,719,483,617. That was $200 million larger than the 1946 total, and the largest since 1932. Despite this fact, industry executives are concerned because existing plant is so greatly undervalued in relation to current replacement costs. This means that depreciation allowances permissible under existing tax laws and based upon the original cost of plant investments are inadequate to provide for replacements.

As a measure toward offsetting this condition, several steel companies in 1947 made additional charges for depreciation, even though taxes had to be paid upon

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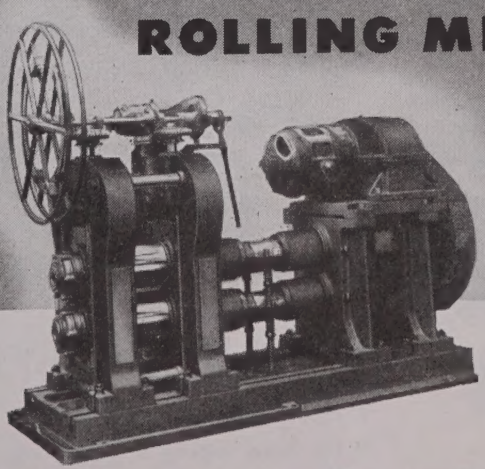

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These exceptionally sturdy, *ready-made* "Hallowell" Work Benches of Steel, with smooth, serviceable laminated wood tops, withstand wear, year-in and year-out. Unlike wooden benches "Hallowell" Steel Benches are standardized as to lengths, widths and heights and may be easily moved and re-arranged to suit. They can also be bolted together to form continuous benches of almost any length; therefore, they represent the most serviceable and inexpensive shop equipment, because of their extreme flexibility. If so desired, "Hallowell" Bench tops may be of steel, or steel covered with "Tempered Presdwood." Prices and deliveries are very attractive . . . ask for your copy of the "Hallowell" Shop Equipment Catalog.

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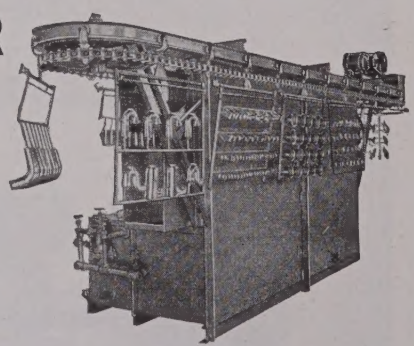

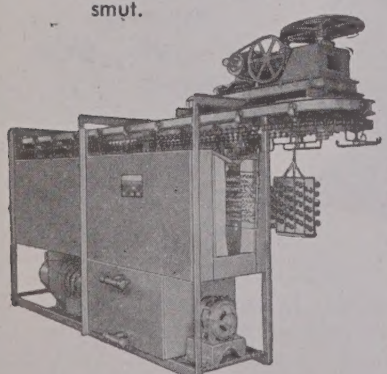

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the extra funds allotted for depreciation over the amounts allowable by law. In 1947, these companies charged $232,624,777 toward depreciation and depletion, as compared with $167,822,175 in 1946.

Founders Society Forms New Management Group

Cleveland

• • • **Gray Iron Founders'** Society has announced the formation of a Connecticut group of management executives embracing the state of Connecticut and part of Massachusetts.

Arthur E. Enquist, president, Connecticut Foundry Co., Rocky Hill, Conn., was elected chairman pro tempore, pending more formal organization at the next meeting several weeks hence.

R. L. Collier, executive vice-president of the society, stressed the work being done by John L. Carter, the society's cost consultant, in connection with cost group activities. Regarding the voluntary allocation of pig iron for the government's residential housing program under Public Law 395, he stated that there would be a public hearing on June 11 in Washington to approve a plan which has been prepared by the Office of Industry Cooperation.

If there is any question of preferential or discriminatory distribution of pig iron under this plan, Mr. Collier asserted there would be a bitter fight waged by the society to protect the interests of every gray iron foundry in the United States, large or small, whether or not they participate in the housing program.

Net Income Decreases

Chicago

• • • **International Harvester** Co. reported net income for the first six months of its 1948 fiscal year was $28,519,000, a decrease of $6,352,000 under the net income for the same period of 1947. John L. McCaffrey, Harvester president, stated that while sales for the half year ended Apr. 30, 1948, were $433,889,000 as against $342,211,000 in 1947, the cost of goods sold and expenses have risen even faster, with the result that net revenue from sales for the first half of this year was $15,405,000 less than in 1947.